This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

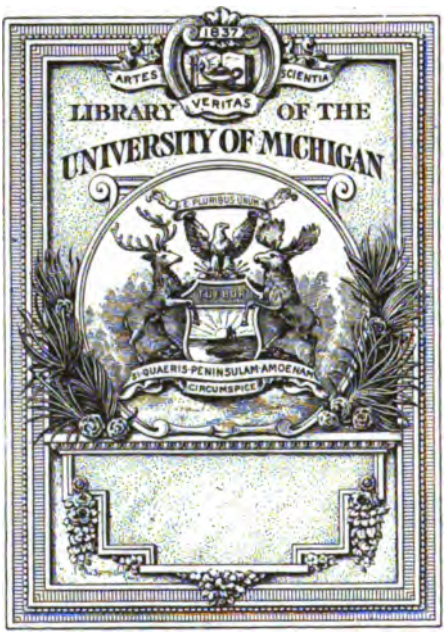
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`



THE GIFT OF
Minn. Hort. Society

SB
21
.M66
A3

Truly yours C. Y. Lacy

LONGBEACH, CALIFORNIA.

[See Biography.]

Trees, Fruits and Flowers

OF

MINNESOTA.

1901

EMBRACING THE TRANSACTIONS OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY

FROM DECEMBER 1, 1900, TO DECEMBER 1, 1901.

INCLUDING THE

TWELVE NUMBERS OF "THE MINNESOTA HORTICULTURIST"

FOR 1901.

EDITED BY THE SECRETARY,

A. W. LATHAM,

OFFICE AND LIBRARY, 207 KASOTA BLOCK,

MINNEAPOLIS, MINN.

Official Stenographer, A. G. LONG, Excelsior, Minn.

VOL. XXIX

MINNEAPOLIS:

HARRISON & SMITH CO.

1901.

After graduation he returned to work on his father's farm, taught district school during the following winter, made a tour of western agricultural colleges in the summer of 1874, and in the fall of the same year received an invitation from the University of Minnesota that resulted in an engagement as professor of agriculture, which continued for nearly six years. For nearly the same period the Minnesota State Horticultural Society invested him with the office of secretary, having filled this honorable position during the years 1875, 1876, 1877, 1878 and 1879, and until he removed from the state. In this capacity Mr. Lacy is well remembered for his energy and zeal in promoting the work of the society. At the time of his retirement from the office he was elected an honorary life member. For this society and its members he still holds the very highest esteem, as we may judge by his own words:

HOME OF CHARLES Y. LACY, LONGBEACH, CAL.

"I think my membership in this society gives me more pleasure than any other honor I have received. Each number of the Horticulturist and each volume of the transactions fills me anew with wonder and admiration for the boundless courage and perseverance shown by the members of this society in discovering facts and methods, in originating and developing varieties, in imparting knowledge, in spreading and stimulating taste for horticultural products. Success ought to reward such unwearying and unremitting

efforts, and I am glad to feel that it does. I am glad to note that success is shown in the improvement around thousands of northwestern homes, that it is shown in the membership of the society and the attendance at its meetings, that it is shown in the esteem of the people as exhibited in legislation for the aid and promotion of horticultural objects."

During this period, also, he was for one year secretary of the Industrial Section of the National Educational Association, and an occasional contributor to the Farmers' Union and other Minneapolis papers.

The allurements of sheep raising and wool growing drew Mr. Lacy to Montana in 1880, where he continued to reside for nineteen years. In 1888 he married Miss Ella F. Peck, of Providence, R. I. In 1895 financial wreck overtook his business as the combined result of the repeal of duty on wool and panic conditions generally. Four years later he removed to California, and his home is now in the city of Longbeach, on the shore of the Pacific ocean.

Mr. Lacy is still in the prime of life, with many years of activity before him, and we expect to hear of a renewed interest in horticultural pursuits in the land of sunshine to which he has removed, and of successful, practical results therefrom. Some of the best California fruit growers have graduated from the Minnesota State Horticultural Society. A. W. L.

ANNUAL MEETING, DEC. 4-7, 1900, MINNESOTA STATE HORTICULTURAL SOCIETY.

F. H. NUTTER, MINNEAPOLIS.

The thirty-fourth annual meeting of the Minnesota State Horticultural Society has become a part of our history and a very pleasant incident therein, too.

In anticipation of an attendance which would require more extended accommodations than hitherto, the lecture room and adjacent class rooms of the Plymouth church were secured for the use of the society, and this anticipation was not unfounded, for before the session of Tuesday forenoon was adjourned 125 members were found to be in attendance. It may safely be stated that the attendance was fifty per cent larger than at any previous meeting. In the exhibition rooms a similar, though not so large, increase was noted, the number of entries being 278, compared with 251 in 1899 and 198 in 1898. The accommodations of the two commodious exhibition rooms, however, were taxed to the utmost. $110 was divided up as premiums.

In addition to our own membership and the attendance of interested visitors from the city, delegates and visitors were present from sister societies in Wisconsin, Iowa, North and South Dakota and Manitoba, and by their greetings and participation in the various discussions added much to the enjoyment of the occasion. They were: A. P. Stevenson, Nelson, Manitoba; Prof. C. B. Waldron, Fargo, N. D.; Prof. N. E. Hansen, Brookings, S, D.; Mrs. Laura A. Alderman, Hurley, S. D.; Chas. F. Gardner, Osage, Ia.; J. S. Trigg, Rockford, Ia.; C. L. Watrous, Des Moines, Ia.; Prof. E. S. Goff, Madison, Wis.; Chas. G. Patten, Charles City, Ia.

Several innovations were made in the preparations for this meeting which were appreciated.

The numbered badges with their accompanying books, containing names of 196 persons intending to be present, served as letters of introduction to strangers, and with the ushers and reception committees designated for the different days did much to make every one feel at home.

The Minnesota Bee-Keepers' Association, the Ladies' Auxiliary and the Minnesota State Forestry Association, convened as usual in connection with this meeting, and while transacting their business and carrying out their special programs separately, also took charge of a half day's session in the regular proceedings of the Horticultural Society.

The Women's Auxiliary, occupying the most of Wednesday afternoon's session, is entitled to wear royal colors over the result of its splendid program. The speakers assigned were all on hand, and the subjects presented aroused most enthusiastic interest on the part of the listeners. The state society must look to its laurels.

All of these matters will be more fully reported in our magazine through the year, but two events of interest can hardly be presented to the best advantage by the reporter's skill alone and would require the assistance of the artist to bring them intelligently to the reader's mind.

On Wednesday evening, Prof. E. S. Goff, with the aid of the stereopticon, set forth the construction and life history of the "Flower Buds on Our Fruit Trees," drawing therefrom deductions as to methods to be adopted in the improvement of our orchard crop.

Following this, by the use of the lantern, and slides prepared from photographs taken by himself, Prof. S. B. Green, of the State Experiment Station, took the audience, in mind at least, over much of the route pursued by him last summer in investigating the forest and horticultural conditions of central Europe. This was the more interesting from the fact that his words and illustrations treated not

of the cities, cathedrals, palaces, etc., usually spoken of by travelers, but with the scenes of village and rural life.

In the "Memorial Hour," Thursday afternoon, Hon. S. M. Owen spoke feelingly of the life and work of the late Col. John H. Stevens; Mr. E. A. Webb performed the same service for the late Maj. A. G. Wilcox, and Mr. L. R. Moyer for the lamented Miss Sara M. Manning.

Following this Mr. Oliver Gibbs, of Prescott, Wis., presented the subject of the proposed "Gideon Memorial Fund," which resulted in a subscription on the spot to the amount of $225 towards the $1,000 it is proposed to raise. It was a moment of profound interest to the lovers of horticulture in the northwest.

On Thursday evening there was not only "a feast of reason and a flow of soul," but also an ample supply of more material luxuries, as over 100 members and friends gathered around the banquet table and discussed first a good supper and then the following menu of toasts, which held the guests without a break from 7 o'clock till the late hour (for horticulturalists) of 10:30:

1. The humor of Minnesota horticulture—"O wad some power the giftie gie us" to see it.....Lycurgus R. Moyer
2. The outposts of Minnesota—we are holding them down.... .....T. A. Hoverstad
3. Woman's sphere: to sit high at ease and see the race go by.. .....Mrs. A. A. Kennedy.
4. Dried apples—a valuable Iowa product.....J. S. Trigg, Rockford, Iowa
5. "Graftings".....Miss Josephine Bonaparte Rice
6. The Yankee in Europe—he is glad he went away and not sorry to be back.....Prof. S. B. Green
7. Mushrooms on toast.....A. F. Brayton
8. "So near and yet so far"—Minnesota is good enough if you can't live in Iowa.....C. F. Gardner, Osage, Ia.
9. The useful and the beautiful—happily combined in our public parks.....C. M. Loring
10. "Christopher Columbus and George Washington."..... .....Ye Reporter—A. G. Long
11. In Memoriam—no word so sad as that word that must sometime be said, goodby.....J. S. Harris

A fine orchestra added much to the enjoyment of the occasion.

The success of this innovation promises well for its being an annual occurrence hereafter.

At the annual election no changes were made in the executive officers and with renewed vigor, under experienced and well-tried

leaders, our society enters upon another and, it is to be hoped, a still more prosperous year in its history.

Promptly at the time set on Friday afternoon the meeting adjourned "sine die" with the program completed and the members and visitors filled with enthusiasm for their work.

OFFICERS, 1901, MINNESOTA STATE HORTICULTURAL SOCIETY.

PRESIDENT.

W. W. Pendergast.....Hutchinson

VICE-PRESIDENTS.

First Congressional District.....Jonathan Freeman, Austin
Second Congressional District.....C. E. Older, Luverne
Third Congressional District....Mrs. A. A. Kennedy, Hutchinson
Fourth Congressional District .....W. J. Tingley, Stillwater
Fifth Congressional District.....A. D. Leach, Excelsior
Sixth Congressional District.....Frank Mesenburg, St. Cloud
Seventh Congressional District.....J. L. Adams, Glenwood

SECRETARY (AND LIBRARIAN *ex-officio.*)

A. W. Latham.....Minneapolis, Minn.
Office and Library, 207 Kasota Block.

TREASURER.

A. B. Lyman .....Excelsior

EXECUTIVE COMMITTEE.

(The president and secretary are members ex-officio.)
Wyman Elliot, (Chairman), 3 years .....Minneapolis
J. S. Harris, 3 years.....La Crescent
J. P. Andrews, 1 year.....Faribault
L. R. Moyer, 1 year.....Montevideo
Prof. S. B. Green, 2 years.....St. Anthony Park
Clarence Wedge, 2 years.....Albert Lea

ASSISTANT LIBRARIAN.

E. A. Cuzner, Essex and 27th Ave. S. E.....Minneapolis
(The Assistant Librarian has charge of the surplus reports of the society, which are stored at Pillsbury Hall, State University.)

SUPERINTENDENTS OF TRIAL STATIONS, 1901.

Prof. S. B. Green, (State Experiment Station)..St. Anthony Park
E. H. S. Dartt .....Owatonna
Dewain Cook .....Windom
Chas. W. Sampson, (grapes).....Eureka
O. M. Lord, (plums and small fruits).....Minnesota City
H. M. Lyman, (apples).....Excelsior
J. S. Harris.....La Crescent
L. R. Moyer.....Montevideo
Mrs. Jennie Stager.....Sauk Rapids
William Somerville .....Viola
J. S. Parks.....Pleasant Mounds

STANDING COMMITTEES FOR 1901.

FRUIT LIST.

Clarence Wedge.....Albert Lea
J. P. Andrews.....Faribault
Prof. S. B. Green.....St. Anthony Park

SEEDLING FRUITS.

J. S. Harris.....La Crescent

ORNAMENTAL LIST.

F. H. Nutter.....Sykes Block, Minneapolis
L. R. Moyer.....Montevideo
Fred Nussbaumer .....St. Paul

NOMENCLATURE AND CATALOGUE.

J. S. Harris.....La Crescent
Prof. S. B. Green.....St. Anthony Park
Prof. N. E. Hansen.....Brookings, S. D.

LEGISLATURE.

Wyman Elliot.....Minneapolis
J. M. Underwood .....Lake City
D. R. McGinnis.....St. Paul
J. S. Harris.....La Crescent
Prof. W. M. Hays .....St. Anthony Park
A. W. Latham.....Minneapolis

PUBLICATION.

Prof. S. B. Green.....St. Anthony Park
Wyman Elliot.....Minneapolis
A. W. Latham.....Minneapolis

GIDEON MEMORIAL FUND.

Wyman Elliot.....Minneapolis
Prof. S. B. Green.....St. Anthony Park
A. W. Latham.....Minneapolis

AWARD OF PREMIUMS, ANNUAL MEETING, 1900, MINNESOTA STATE HORTICULTURAL SOCIETY.

APPLES.

Apples.	Exhibitor.	Premium.	Amount.
Peck of Wealthy	Jewell Nursery Co.	Second	$2.00
Collection	"	First	6.00
Collection	W. L. Parker.	Second	4.00
Collection	J. S. Harris.	Third	2.00
Peck of Wealthy	J. A. Howard.	First	3.00

ALFRED TERRY,
W. L. TAYLOR,
Judges.

APPLES KEPT IN COLD STORAGE.

Wealthy	"	First	.50
Longfield	"	First	.50
Peter	"	First	.50
Minnesota	"	First	.50
Hyslop	"	Second	.25
Briar's Sweet	"	First	.50
Rollin's Pippin	"	First	.50
Rollin's Prolific	"	First	.50
Swaar	"	First	.50
Fameuse	J. S. Harris.	Second	.25
Ostrekoff	"	First	.50
Okabena	"	Second	.25
Wolf River	"	First	.50
Northwestern Greening	"	First	.50
Haas	J. A. Howard.	First	.50
Patten's Greening	"	Second	.25
Virginia	Gust. Johnson.	First	.50
Transcendent	"	Second	.25
Gideon	Ansel Gideon.	First	.50
Peter	"	Second	.25
Antinovka	J. S. Harris.	First	.50
Malinda	Thos. Redpath.	First	.50
Pride of Minneapolis	"	First	.50
Tonka	"	First	.50
Virginia	"	Second	.25
Wealthy	H. H. Pond.	Second	.25
Hibernal	"	First	.50
Charlamoff	"	Second	.25
Repka	"	First	.50
Briar's Sweet	"	Second	.25
Transcendent	"	First	.50
Florence	"	First	.50
Minnesota	"	Second	.25
Antinovka	P. H. Perry.	Second	.25
Phoebe	H. H. Heins.	Second	.25
Grundy	"	Second	.25
Peerless	"	Second	.25
Lyman's Prolific	H. M. Lyman.	First	.50
Gilbert	J. A. Howard.	First	.50
Harding	"	Second	.25
Long Arcade	"	First	.50
Peerless	"	First	.50
Ben Davis	"	First	.50
Walbridge	"	First	.50
Utter	"	First	.50
McMahon	"	First	.50
Gen. Grant	"	First	.50
Okabena	"	First	.50
Gideon	"	Second	.25
Blushed Calville	"	Second	.25
Repka	W. L. Parker.	Second	.25
Fameuse	"	First	.50
Malinda	"	Second	.25
Anisim	"	First	.50
Charlamoff	"	First	.50
Hibernal	"	Second	.25
Tetofsky	"	First	.50
Whitney	"	Second	.25
Hyslop	"	First	.50
Greenwood	"	First	.50
Cross	"	First	.50
Duchess	"	First	.50
Christmas	Jewell Nursery Co.	First	.50
Patten's Greening	"	First	.50
Northwestern Greening	"	Second	.25
Rollin's Prolific	"	Second	.25
Ben Davis	"	Second	.25
Grundy	"	First	.50
Harding	"	First	.50
Martha	"	Second	.25
White Pigeon	"	First	.50

Apples.	Exhibitor.	Premium.	Amount.
Wolf River	Jewell Nursery Co.	Second	.25
Haas	"	Second	.25
Yellow Transparent	"	First	.50
Early Strawberry	"	First	.50
Dartt	"	First	.50
Judson	"	First	.50
Tetofsky	"	Second	.25
Anisim	"	Second	.25
Peach	"	First	.50
Humbolt	"	First	.50
McMahon	"	Second	.25
Blushed Calville	"	First	.50
Orange	"	First	.50
Duchess	"	Second	.25
Maple	"	First	.50
Phoebe	"	First	.50
Longfield	P. H. Perry.	Second	.25
Whitney	"	First	.50
Martha	"	First	.50
Florence	"	Second	.25
Walbridge	"	Second	.25

JOHN P. ANDREWS,
Judge.

APPLES NOT KEPT IN COLD STORAGE.

Minnesota	Jewell Nursery Co.	First	.75
Peter	W. L. Parker.	Second	.50
Fameuse	Ditus Day.	First	.75
Malinda	"	Second	.50
Talmon Sweet	"	Second	.50
Judson	H. H. Heins.	First	.75
Tama	H. H. Heins.	First	.75
Rollin's Prolific	W. S. Widmoyer.	First	.75
Rollin's Pippin	"	First	.75
Peerless	Thos. Redpath.	First	.75
Wealthy	"	First	.75
Gideon	Ansel Gideon.	Second	.50
Peter	"	First	.75
Malinda	C. W. Merritt.	First	.75
Ben Davis	F. Yahnke.	First	.75
Fameuse	J. S. Harris.	First	.75
Walbridge	"	Second	.50
Wealthy	J. A. Howard.	Second	.50
Haas	"	First	.75
McMahon	"	First	.75
Hyslop	H. H. S. Rowell.	First	.75
Talmon Sweet	Wm. Oxford.	First	.75
Walbridge	"	First	.75
Ben Davis	"	First	.75

C. E. OLDER,
Judge.

SEEDLING APPLES.

Seedling	S. A. Alling.	First	3.00
Seedling	L. W. Prosser.	Second	2.00

J. S. HARRIS,
N. E. HANSEN,
Judges.

GRAPES.

Moore's Diamond	C. W. Sampson.	First	.75
Agawam	"	Second	.50
Iona	"	First	.75
Worden	"	Second	.50
Green Mountain	"	First	.75
Collection	"	First	3.00
Agawam	Gust. Johnson.	Second	.50
Lindley	"	First	.75
Moore's Diamond	"	Second	.50
Iona	"	Second	.50
Barry	"	First	.75
Empire State	"	First	.75
Collection	J. R. Cummins.	Second	2.00
Brighton	"	First	.75
Agawam	"	First	.75
Worden	"	First	.75
Delaware	"	First	.75

J. W. MURRAY,
Judge.

FLOWERS

Collection of Carnations	Jewell Nursery Co.	First	2.00
Table Bouquet	"	First	2.00
Collection of Plants	E. Nagel & Co.	First	5.00
Collection of Cut Roses	"	First	2.00
Collection of Carnations	"	Second	1.00
Table Bouquet	"	Second	1.00

MRS. H. K. EVES,
Judge.

HONEY.

Honey.	Exhibitor.	Premium.	Amount.
Extracted	J. B. Jardine.	Second	2.00
Extracted	F. Moeser.	First	3.00
Comb	H. G. Acklin.	First	5.00
Extracted	"	Second	2.00

H. H. HEINS,
E. R. POND,
J. A. HOWARD,
Judges.

FRUIT LIST.

(FOR THE GUIDANCE OF PLANTERS.)

Adopted by the Minnesota State Horticultural Society, December 6, 1900.

APPLES.

Of the first degree of hardiness for planting in Minnesota: Duchess, Hibernal, Charlamoff (a), Patten's Greening.

Of the second degree of hardiness: Wealthy (b), Longfield (b) (d), Tetofsky, Malinda (b) (c).

Promising varieties for trial: Okabena, Peerless, Repka Malenka, Anisim, Yellow Sweet (c), Kaump (d), Gilbert, Brett, Christmas (c), Blushed Calville, Cross 413, White Pigeon (d).

CRABS AND HYBRIDS.

Best for general cultivation: Virginia, Martha, Whitney, Early Strawberry, Minnesota (c), Sweet Russett, Gideon's No. 6, Briar's Sweet.

Promising varieties for trial: Dartt, Pride of Minneapolis, Crampton's No. 3, Lyman's Prolific, Faribault.

PLUMS.

Best for general cultivation: De Soto, Forest Garden, Weaver, Cheney, Wolf, Rollingstone, Wyant.

Most promising varieties for trial: Ocheeda, New Ulm, Stoddard, Surprise, Mankato, Aitkin, Owatonna.

GRAPES.

In order of their ripening: Moore's Early, Worden, Janesville (e), Brighton, Delaware, Agawam, Concord.

RASPBERRIES.

Red varieties: Turner, Marlborough, Cuthbert, Loudon.

Black and purple varieties: Ohio, Palmer, Nemaha, Gregg, Older, Columbian, Kansas.

BLACKBERRIES.

Ancient Briton, Snyder, Badger.

CURRANTS.

Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland, North Star.

GOOSEBERRIES.

Houghton, Downing, Champion. Varieties for trial: Red Jacket, Triumph, Pearl, Columbus.

STRAWBERRIES.

Pistillate: Crescent, Warfield, Haverland. Staminate: Bederwood, Capt. Jack, Wilson, Enhance, Lovett, Splendid, Mary.

NATIVE FRUITS.

Valuable for trial: Dwarf Juneberry, Sand Cherry, Buffalo Berry, High Bush Cranberry.

(a) Peterson's Charlamoff.—There are two distinct kinds under this name; the one referred to is of spreading growth and bears conical shaped fruit.

(b) Does best top-worked.

(c) Tardy bearer. (d) Early bearer. (e) For severe situations.

Mr. F. W. Kimball: I wish to inquire whether the Rockford is to be dropped from the trial list or dropped entirely.

Mr. J. P. Andrews: Dropped entirely.

Mr. Kimball: I wish to protest against the dropping of the Rockford. I planted it four or five years ago, and it has borne as good or better a selling plum than anything I have. The plum is of excellent flavor, dark, with a bluish color and in every way a remarkable fruit, and is the most prolific bearer in the whole orchard.

PRESIDENT'S ANNUAL ADDRESS.

W. W. PENDERGAST, HUTCHINSON.

We have reached another milestone in our pleasant journey towards the beautiful gardens that have so long tempted us with their verdant lawns, their brilliant flowers and their glistening, sun-kissed fruits. From eminences occasionally reached we have sometimes caught ravishing glimpses of the enchanted lands whither we are endeavoring to wend our way. Though on the whole we are nearing the object of which we are in search, the path we have followed has oft been devious and sometimes in the wrong direction altogether. Now it is with us as it was with the followers of Columbus when they were approaching the shores of a new world and found the signs of land so numerous, the evidences so strong that even the weak-kneed and faint-hearted ones plucked up courage and went on to victory and the glory that came with it. There were no more clamors to go back; abuse of their leader and threats of vengeance were hushed; success had come—and what else succeeds like it?

Now, too, the signs are all in our favor, the proofs that we have not labored so long in vain are as irresistible as are the demonstrations of the propositions of Euclid. The bright glimpses, which, heretofore, have come to us like angels' visits, have changed to a full view. The faith of our old stagers has been lost in sight, and hope is swallowed up in victory.

As before hinted, we have sometimes lost ground by following up a wrong trail. For a long time we were led astray by the false doctrine that our apple trees were winter-killed by alternate freezing and thawing. The evidence to the contrary, however, is at last becoming so irresistible that we shall be reluctantly forced to give up that article of our creed to which we have clung so long. On the elevated plateaus between the mountain ranges of Washington the thermometer indicates, for a short time, as low temperature as we have in Minnesota. This is immediately followed by a thaw which soon gives Boreas the right of way, and another "cold snap" occurs. So the pendulum swings back and forth the whole winter long, freezing and thawing all the while treading close upon each other's heels, with almost the same regularity as that with which night follows day. Yet I heard no complaint about the winter-killing of fruit trees, notwithstanding the fact that not more than an inch of rain usually falls from June to November and that the ground is parched and grass withered from the first of July till the next spring. How do apple, pear, cherry and plum trees withstand such severe weather under such trying conditions? It is the frequent thawing that saves them.

At the beginning of winter the ground is very dry. The snow falls early, often before the ground freezes. A cold wave sweeps over the plateau. The mercury falls to thirty degrees below zero. The little sap that the trees had stored for just such a time as this is being rapidly absorbed by the surrounding air. Now comes the chinook, warm from the Japan current. The snow melts; the thirsty earth swallows it; the thirsty trees drink it up again; the danger of immediate death by the seasoning of the smaller branches is past. Then follows another freeze, further absorption of the life-sustaining moisture, and again the soft wind from the Pacific brings healing on its wings. When spring comes the melting snows give plenty of water to induce a vigorous growth, a magnificent bloom and a wonderful setting of fruit. The wood ripens early and goes into winter quarters well protected by a coat of mail to meet the attack which winter is sure to make.

We must not only join the procession and march on to new discoveries, adding something each year to what has been already examined, passed upon and adopted, but we must carefully re-examine and prove the doctrines of our creed which have stood for years unchallenged, and if they will not stand the test of the strongest searchlight let no respect for their age and the dignity it lends influence us to keep them among the thirty-nine articles. We must "ring out the old," while we "ring in the new." When assured that our foundations are solid, we shall be ready for the superstructure.

In the matter of apple growing to reap the greatest benefit from what we have already learned, four problems yet await complete solution:

1. How to avoid root-killing in the most trying winters when there is no snow protection.

2. What can be done to prevent "killing back" and general injury to the tops in the most severe tests?

3. What is the best remedy for summer scald?

4. How shall we secure a first-class winter apple?

These are all questions of the highest importance, and time is going to work out the solution. It is our duty, and it is for our interest to hasten that work. There is a glorious future before us. We must see that it is not too far before us. Here permit me to urge again the importance of dividing the work in a measure among our neighboring northwestern states. Wisconsin, Iowa, the two Dakotas and Minnesota, could by working in harmony but along different lines accomplish at least more than twice as much for the common good as if each state were left to its own devices, investigating the same fields that all are going over and doing it very superficially for want of time, when time would be at their disposal if the other states in doing their allotted work relieved them of the pressure which was pushing them away from the task which they had just got well in hand. I sincerely hope that some arrangement will be made with the adjoining states which have the same obstacles to overcome which confront us, and that something valuable to all may come from the investigations of each. Of course full reports of the work done and the results achieved should be sent to all the states in the association. The fact that these reports would be expected and eagerly desired could not help acting as a powerful stimulus to the highest efforts.

Our native plums are beginning to attract attention everywhere. It behooves us to devote a part of our surplus zeal and energy to their improvement. It is also of importance that we fix upon some way of preparing them for market, as this should be made one of the foremost of the plum-growing states of the Union. This preparation should include the size and kind of baskets, the proper crating, etc. As some kinds which miserably fail in certain localities succeed admirably in others, I would recommend that twenty of the most promising varieties be selected for the benefit of those who want about half that number to plant for a market orchard. Let these twenty be well tested by the plum fancier before any but the old standards are planted in large numbers. Perhaps it

would be well to suggest a tentative orchard of 100 trees giving the number of each kind to plant and the plan of the orchard.

The past season has been a very satisfactory and encouraging one nowithstanding the severe and long continued drought of the summer months. The ability of our trees to withstand these dry summers and snowless winters is strengthening our weak-kneed brethren and inspiring those who have inclined to waver with new faith, and all of us can see more light ahead than greeted our strained vision a dozen years ago. The good time is almost here. All we have to do is "to labor and to wait." The waiting for grand results will not be long. But the full realization of all our hopes will never come; there will always be something of value to work for. We would not have it otherwise. What is life without hope that there is more of good yet to come?

"Auspicious Hope! in thy sweet garden grow
Wreaths for each toil, a charm for every woe."

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

To the Minnesota State Horticultural Society:—Your committee to whom was referred the president's address are glad to concur in all the recommendations therein contained. We are especially glad to concur in the recommendations that this society adopt a standard package for marketing plums, and would suggest that when the form and size of such package are decided upon that the legislative committee be instructed to procure the necessary legislation to secure its adoption.

Respectfully submitted,

Lycurgus R. Moyer,
Frank Yahnke,
Thos. E. Cashman,
Committee.

ANNUAL REPORT OF EXECUTIVE BOARD.

WYMAN ELLIOT.

Owing to the very efficient service we are receiving from our secretary the work of this board has been much lessened the past year, requiring but a limited number of meetings of the full board.

We think there should be a committee of one or more persons designated or created whose duty it should be to critically examine all articles displayed at our horticultural exhibitions and correct the names placed upon all specimens in the various classes whenever incorrectly or synonymously named; thus avoiding much confusion and sometimes an injustice in making awards of premiums in sweepstakes and other collections.

At the last annual meeting of our society, and since then by your executive board, there was some discussion as to the propriety and advisability of erecting an appropriate memorial in remembrance of the life work so generously and devotedly done in the interest of pomology by our departed brother horticulturist, Peter M. Gideon. Your board after having this matter under advisement for some time appointed a committee to devise or formulate some plan whereby this very worthy object might be accomplished. This committee reported several plans to the executive board, and from them one was selected to be submitted to this society, which will be taken up later at this session.

A new experiment station has been created the past year and Mr. J. W. Parks, of Pleasant Mounds, has been designated as superintendent.

There was a committee appointed to examine and report to the society upon the seedlings and valuable grafted varieties of apples now growing in the late Peter M. Gideon's orchards at Lake Minnetonka. Wyman Elliot, Prof. S. B. Green and John S. Harris were appointed, who will report what they found later in the session.

Our horticultural library is very fast outgrowing the room now occupied and to relieve the cramped and crowded condition in the secretary's office new and more commodious rooms should be obtained where the visiting members and patrons of the society can have more extended accommodations.

It is desired on the part of the executive board that every member and delegate attending this meeting may feel free to ask such questions concerning the workings and management of the affairs of the society as they wish. We feel the importance of every member becoming fully identified with all the varied interests and requirements for conducting a successful, progressive horticultural work, and deem it very necessary to keep closely in touch with all its members far and near, and to do so successfully you must on your part not neglect to make known to our secretary your wants, your successes, your failures and what in your estimation the unforeseen exigencies of the times demands of us as faithful servants of a live and up to date modern horticultural organization.

A suggestion.—There should be a purchasing fund created from some source, either by an appropriation from the legislature or from private donations, or possibly a small amount might be set aside from money received from memberships of the society, for the purpose of obtaining cions, trees or plants from originators of new and valuable varieties to be recommended by your executive board

as worthy of propagation at our experiment stations for testing their adaptibility to our climatic conditions, and if found valuable for home or commercial uses then to be distributed to the members of our society for more extended cultivation.

ANNUAL REPORT OF LEGISLATIVE COMMITTEE.

WYMAN ELLIOT, CHAIRMAN.

There has been no call for legislation the past year, nor is it deemed necessary for any new enactments to be obtained, unless the society in its various discussions should discover that some new law should be made in the interest of some particular feature of our horticultural work.

SECRETARY'S ANNUAL REPORT, 1900.

A. W. LATHAM, SECRETARY.

From the standpoint of the secretary's office the year just closing has been a successful one. We have, through our membership roll, through the farmers' institutes, and through other sources open to the ordinary workings of the society, reached more people than ever before, and the unusual attendance at this annual meeting, the increased interest in the work of the society and the steady enlargement of the membership roll, furnish ample evidence of the increased usefulness of this association.

The annual membership for the year at this date, Dec. 6, 1900, stands at 803. It will be increased somewhat, as usual, by later additions. This roll numbers 43 more than the same roll a year ago on the same date.

The life membership roll has had a corresponding increase. Upon the action of the late annual meeting, the honorary list was increased by the addition of nine names, and it has been decreased by one by the death of the lamented Col. John H. Stevens, leaving eight for the total increase of this roll. The regular life list has been increased by the addition of the following five names: E. C. Loose, of Steen; G. W. Strand, Taylor's Falls; R. H. L. Jewett, St. Paul; and Gust Johnson, Excelsior. One name has been lost from this roll by death, that of J. A. Boxell, of St. Paul, making a total increase of four in this roll. Putting the three rolls together, there is a total increase of 55, making the total membership for the year 880, not including a few honorary members for one year.

A communication from a friend in a neighboring state inquires how our roll is made up, and whether it consists of memberships secured in towns where the society meets, to show the public

spirit of the place, as he indicates has sometimes been the case of similar associations within his knowledge. We are glad to be able to say that there are no such names upon this roll. There are three factors that especially contribute towards this large roll, perhaps the greatest being the loyalty of the members of the society and the personal efforts put forth by them to extend its usefulness; another is undoubtedly the method in which our reports are published, making them comparatively available and attractive reading matter; a third is found in the efforts made by the lecturer on horticulture in the farmers' institutes. Hon. A. K. Bush has occupied that position with great credit the past year, and has distributed a large amount of literature from the secretary's office, contributing by his personal efforts in this work 151 members. Each one of these represents a bona fide interest in the work of the horticultural society, two or three being picked up in each place where the institute meets. As Mr. Bush occupies the place again this winter, and returns are already coming in, we may expect similar valuable work from him in the immediate future.

Besides the usual routine work of the office, which with so large a membership roll you may judge is considerable, there has been done this year some special work; first, in connection with an effort to trace the seedlings that Mr. Gideon sent out some ten or twelve years ago, to ascertain if there is anything of value amongst them. This work was undertaken at the suggestion of Mr. Wyman Elliot, chairman of the executive board, and he has gathered the results and will spread them before you later in the meeting.

A circular letter was also sent out later in the year to all the members, asking for certain information with which it would be an advantage for the secretary to be acquainted. This was generally replied to, but not in full, and it is on this account that reference is made to it here, as a similar circular is liable to be sent out the ensuing year. I desire to make an appeal for the full co-operation of the society in this branch of its work.

This report can hardly be made without reference to the part our society took at the state fair and the grand results attained in the horticultural building. While the society is not officially connected with that institution, yet we deserve very largely the credit which accrues to a successful exhibit in this department. Besides the regular exhibitors, there were quite a number of new ones, and I take this opportunity to urge that more of our people who have not exhibited at the fair try to do so in the early future. When a person begins exhibiting at the fair it is a rare thing for him not to continue to do so with regularity. There is a pleasure as well as

profit connected with it that is very certain to bring about this result. We hope to see many new faces amongst the exhibitors at the state fair the coming year.

There have been a number of additional competitors for the $1,000 premium offered for a seedling apple tree the past year, and considerable correspondence has come into the office in connection with this, which has been turned over to Prof. S. B. Green, chairman of the committee having this matter in charge, of which he will report with some fullness. The display of seedlings from this source, now on exhibition in an adjoining room, is in the line of this work.

Some changes in the printing of our report have been suggested, in the way of using a coarser type and decreasing the number of reports bound in paper, which will probably be put into execution, both of these items adding to the convenience or permanence of the report. The demand for the report is fully up to the limit, with our large membership.

I present you herewith the financial report of the society for the year 1900:

RECEIPTS.

Balance on hand in Hennepin County Savings Bank, Dec. 7, 1899..	$679.95
Interest on deposit in Hennepin County Savings Bank.....	18.29
Books sold	9.80
Life membership fees	80.00
Advertisements in magazine	97.00
Railway tickets sold	3.75
Minnesota State Fair	8.00
Annual Membership fees for 1899	24.00
Annual membership fees for 1900.....	708.00
Annual membership fees for 1901.....	166.00
Sundries	14.00
Total	$1,808.79

EXPENDITURES.

Telegrams	$4.43
Expenses, Annual Meeting, 1899.....	91.32
Reporting meeting, 1899	99.40
Assistance in office	31.05
Delegate's expenses	68.74
Vice-president's expenses	12.86
Supt. Trial Station, expenses	10.00
Office supplies	11.42
Printing	134.28
Postage	141.88
Express	89.04
Insurance	8.00
Expenses, Executive Board	37.16
Library	12.05

Engravings for magazines	63.27
Rent of office	144.00
Gideon seedling trees (1,000)	20.00
President's salary and expenses	42.25
Books used as premiums	68.50
Expenses of treasurer	4.75
Asst. librarian's salary	10.00
Expenses summer meeting, 1900	.85
Expenses annual meeting, 1900	15.58
Sundries	4.58
Dues on membership	104.25
Directing magazines	12.00
Printing, Woman's Auxiliary	15.00
Balance in Hennepin County Savings Bank	548.24
Balance paid to treasurer	3.89
Total	$1,808.79

Such of you as have visited the secretary's office lately have found it a very crowded place. The books already in more than fill the shelves, and the accumulation of other matter points to the necessity of an early enlargement; but we are attached to the old quarters and are loath to leave them, even for something more commodious, and we are hopeful that we shall get along another year without increase of expense in this item.

The doors of the office are ever open for the membership, and we hope those from abroad when visiting the city will not fail to take opportunity to call upon the secretary and see the equipment of our office and library.

TREASURER'S ANNUAL REPORT, 1900.

REPORT OF CHAS. W. SAMPSON, TREASURER.

RECEIPTS.

1899.	
Dec. 4. Balance from previous year	$298.10
" 4. A. W. Latham, receipts, secretary's office 6|1-12|4, 1899	332.65
Total	$630.75

DISBURSEMENTS.

1899.	
Order No. 77, Exp. Secretary's office, 6|1 12|4	$336.66
Order No. 78, J. S. Harris, Exp. Ex. Bd.	20.00
Order No. 79, J. S. Harris, Exp. Seedling Com.	15.04
Order No. 80, L. R. Moyer, Ex. Ex. Bd.	13.37
Order No. 81, Prem. winter meeting, 1899	112.00
H. M. Lyman, treasurer's balance	133.68
Total	$630.75

REPORT OF H. M. LYMAN, TREASURER.

RECEIPTS.

1900.	
Feb. 14. C. W. Sampson, Treas.	$133.68
" " State treasurer	750.00
June 22. A. W. Latham, Sec'y, annual dues, etc.	892.50
Aug. 12. State treasurer	750.00
Total	$2,526.18

DISBURSEMENST.

March 1, Order No. 81, A. W. Latham, sec's. salary, first quarter, 1900	$225.00
April 25. Order No. 82, S. B. Green, appropriation for expenses European trip investigating horticulture	100.00
June 1. Order No. 83, A. W. Latham, secy's. salary second quarter, 1900	225.00
" 19. Premiums, summer meeting, 1900	80.00
" 22. Order No. 84, A. W. Latham, expenses 12|5|99-6|18|1900, secretary's office	908.74
Sept. 1. A. W. Latham, secretary's salary, third quarter, 1900.	225.00
Balance on hand	762.44
Total	$2,526.18

ANNUAL MEETING, SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

MRS. C. E. BRAINERD, SECRETARY, ALBERT LEA.

The eighth annual meeting of the Southern Minnesota Horticultural Society was held in the G. A. R. hall, Austin, Minn., Nov. 20, 21 and 22, 1900. Meeting called to order at 1 o'clock p. m. with President J. C. Hawkins in chair. The weather was unfavorable, the roads in very poor condition and the people in the vicinity not particularly interested; consequently the first session opened with a small audience. The second day there was a good attendance, and the third day a fairly good one. Several of the persons who had promised to write papers failed to put in an appearance or to send a paper or substitute. This was especially disappointing to the program committee. Notwithstanding all these discouragements, we had interesting, instructive, elevating and cheerful sessions, morning, afternoon and evening. What was lacking in numbers was made up in intelligence and appreciation. The papers were good and to the point, showing much careful study, research and experience. Every paper brought out spirited and animated discussions. The display of fruit was a good one. There was a great variety of apples, a few varieties of plums and other small fruits in cans. This was an important and interesting feature of the meeting. There was also a

display of evergreens set out in jars, which was very attractive, and by their presence brought out many ideas and suggestions.

Jonathan Freeman was elected as a delegate to attend state society in December, 1900. L. W. Allen was elected as delegate to attend state society in 1901.

On the second day of the meeting President Hawkins gave an address of welcome, which was spontaneous and eloquent, and made the visitors from abroad feel very much at home. We had with us J. H. Upton, of Cresco, Ia.; C. F. Gardiner, Osage, Ia.; Hon. Eugene Secor, Forest City, Ia.; J. S. Harris, La Crescent; O. F. Brand, Faribault; Elmer Reeves, Waverly, Ia.; Rev. Mosher, Albert Lea, and Rev. Cressey, Austin. It inspired the members of the local society to have these intelligent, well posted gentlemen present, as they added dignity, profit and pleasure by their presence. A motion was made and carried that the delegates from Iowa, Hon. Eugene Secor and Elmer Reeves, be made honorary members of this society for the year 1901. A motion was made and carried that the next annual meeting be held at Spring Valley, some time in January, 1901, date to be set by the executive committee, also number of days to hold the meetings. The meeting was then adjourned, after which there were many hearty hand shakes, and feeling good byes, all departing with the feeling that it was good to be there.

OFFICERS FOR 1901.

President— J. C. Hawkins, Austin.
Vice-president, three years—E. F. Peck, Riverview Farm, Austin.
Vice-president, two years—Jonathan Freeman, Austin.
Vice-president, one year—O. W. Moore, Spring Valley, Minn.
Secretary and Treasurer—Mrs. C. E. Brainerd, Albert Lea, Minn.

FRUIT COMMITTEE.

Three years, L. W. Allen, (Fillmore Co.), Spring Valley, Minn.
Two years, Jens Jensen, (Mower Co.), Austin, Minn.
One year, Jonathan Freeman, (Freeborn Co.), Austin, Minn.

SEEDLING COMMITTEE.

Three years, C. Morgan, (Fillmore Co.), Forestville, Minn.
Two years, Geo. Prescott, (Freeborn Co.), Albert Lea, Minn.
One year, F. W. Kimball, (Mower Co.), Austin, Minn.

Food Value of Stone Fruits.—Stone fruits have a high water content and as a consequence when eaten fresh are expensive, as the cost is out of all proportion to the nutritive material furnished. The same fruits dried contain much less water and therefore have a higher food value. It must not be forgotten, however, that fruits are valuable for other reasons than the nutriment furnished. They contain acids and other bodies which are believed to have a beneficial effect on the system and often stimulate the appetite for other foods.

TWENTY-FIFTH ANNUSL MEETING MINNESOTA STATE FORESTRY ASSOCIATION.

GEO. W. STRAND, SEC'Y, TAYLOR'S FALLS.

Thursday afternoon, Dec. 6th, a joint session was held in Plymouth church, Minneapolis, with the horticultural society. The reports, discussions and talks all bore evidence of the awakened interest in these matters.

The business session was called to order by Pres. Cross at 1 o'clock, and after the usual routine of business, the reading of the secretary's report and financial statement, the election of officers was taken up, resulting as follows:

OFFICERS FOR 1901.

PRESIDENT.

Chas. M. Loring.....Minneapolis

Secretary and Treasurer.

Geo. W. Strand ..... Taylor's Falls

VICE-PRESIDENTS.

First District,.....Wm. Somerville, Viola
Second District.....Alfred Terry, Slayton
Third District.....O. F. Brand, Faribault
Fourth District.....W. P. Allen, St. Paul
Fifth District .....S. M. Owen, Minneapolis
Sixth District.....Asa Paine, Carlton
Seventh District.....O. A. Th. Solem, Halstad

EXECUTIVE COMMITTEE.

Wyman Elliot .....Minneapolis
A. W. Latham .....Minneapolis
J. S. Harris.....La Crescent
Prof. S. B. Green.....St. Anthony Park
D. T. Wheaton.....Morris

Motion made and carried that the president-elect appoint a committe of five, besides himself, to act as a legislative committee.

Motion made and carried that Mr. J. S. Harris draw up a resolution expressing our deep sorrow occasioned by the death of our highly esteemed member and co-worker, Col. John H. Stevens, same to be presented before the joint session. A discussion was started regarding the disposal of forfeited tax sale lands, which resulted in the offering of a resolution in the joint session following, to the effect that such lands not adapted for agricultural purposes should be turned over to the State Forestry Board for forestry purposes.

After the business session a joint meeting was held with the horticultural society, Pres. J. N. Cross taking the chair. A num-

ber of interesting papers were presented, but lack of time did not permit a discussion on them.

Pres. Cross in his opening remarks outlined the work of the association, past and present, and its relation to the various other forestry divisions now carried on by the state. "Its province is to be enthusiastic and even radical by nature. It must be continued as the organized popular power back of advanced forestry movement. As such it must keep the people informed, prod them when they become indifferent and appeal to them in order to awaken an earnest interest which will reach the law-making power."

"A Lumberman's View of the Forestry Situation" was ably given by Col. W. P. Allen, of St. Paul. Among the facts brought out, he stated that the lumberman has little to apologize for, as he has done his share towards the building up of the country and the advancement of civilization. The barriers in the way of the rapid inauguration of a rational forestry system in this country will be mainly owing to the large area to be protected and difficulty of obtaining funds to meet the same; also inducing the government to attempt a general system of forest management. Forest areas that are left untouched are reasonably safe from destructive fires, and the government should withdraw all its timber lands from the market. Private parties cannot hold the same to advantage, whereas the government can and should for the benefit of future generations, thereby regulating the sale and use of timebr. Our conditions differ much from those of Germany, but their spirit is correct, and we hope to learn much by studying their methods.

Prof. S. B. Green, who spent some months the past season studying "forestry conditions in Germany" and other places, gave a very instructive talk on the above topic. It was not without considerable self-sacrifice that this system was established, for at one time Germany's forests suffered abuse nearly as much as ours. The value of timber, system of protection and taxation were touched upon. Although we cannot expect to adopt these methods, we can obtain many good suggestions from this source to base upon. A notable fact was that good roads and good forests accompanied each other. Lands not suited for agricultural purposes are planted to forests. Our native jack pine is looked upon by them as one of their most valuable trees for the sandy plains, and seed of same commands a big price. It is a characteristic of the Germans not to lay out money on land unless it pays, and their foresight in the forest plantations is no exception to this rule.

Dr. Leo. M. Crafts, of Minneapolis, brought out many facts in his talk on the "Wisdom of the National Park Movement" to em-

phasize its necessity. Aside from the practical value such a park would be as a forest reserve and in the protection of our water supply, no other region presents as many points in its favor on the aesthetic side. Its diversity, beauty and accessibility as a health resort commends itself, and for these reasons something must be done at once if it is to be preserved as such.

Conditions have changed much since the time of the association's organization, and now instead of the main issue being the encouragement of prairie planting it is merging into that great question, which demands the best of statesmanship to handle—that of the protection and restoration of our native timber tracts. Although much good can yet be done in all of these lines, the latter will be pre-eminent in the assertion of its rights.

After the lapse of a quarter of a century since its organization, those interested in the solution of the forestry problems have some reason to feel encouraged by its present outlook. The general agitation of these matters and growth of sentiment in their favor would seem to indicate that we have come to that point where the people see the necessity and should demand that forestry receive its due consideration and place. Our legislative bodies must devote more time to their consideration—they must view them fairly and with increasing favor. The past year has brought out many facts to substantiate these statements, making it a year indicative of much coming good to the forestry problems which confront Minnesota.

THE GIDEON MEMORIAL FUND.

OLIVER GIBBS, PRESCOTT, WIS.

The President: Now we come to the Gideon Memorial Fund. It was left with the executive committee a year ago to devise some plan of what we should do that would be in consonance with Mr. Gideon's life and character, something that he would like to have done if anything at all was done. That is about where the matter stands today, and I will say that our old friend, and the friend of Mr. Gideon, and long a member of this society, Mr. Oliver Gibbs, has been spoken to to suggest some plan by which this money can be raised, and I will ask him to present his report now.

The arrow of grief pierced our hearts a year ago and more, when Mr. Gideon died. The eulogies of sorrow and of praise have been spoken. They appear in our annual report for the year just closed. The shaft has been withdrawn, the sharp pain has left us, the wound has healed over, our minds regarding him are in their normal condition. For myself, I say, no more can I think of him except with joy. It is therefore a pleasant duty that I have to speak of him before you at this time. And in doing so I must be governed

by the opinion that I should use my time in speaking of him as a man with advanced horticultural endowments, to the end that our successors and posterity, when we shall have passed along to them the record of his work for their examination, may learn from us, his neighbors and associates, what manner of worker he was, what was the peculiar life and the experience that made him Gideon, and be able to see and understand the lessons to be drawn from his life work. Of his services alone they can judge without contemporaneous testimony, for his works are following him.

There are others who saw more of him in the common walks of life than I did; yet I knew him well, was a visitor at his home and he at mine, nearly a hundred miles apart, and I had his confidence; and during our meetings, socially and otherwise, there were occasions when, under great trial, the genuineness, the true ring of him, were unmistakable.

No words that I can select will adequately express my admiration for the heroes of common life who, knowing themselves, honoring themselves, sure of themselves, having beneficent life purposes, can follow their own ideal, endure criticism, misunderstanding, estrangement, detraction, poverty and all "the slings and arrows of outrageous fortune" that may threaten them, and yet

"Along the cool, sequestered vales of life
Have kept the noiseless tenor of their way."

And when we find a man of this sort, whose aim has been so high that the lofty flight of his purpose has struck an orbit round and round the world, till in its eccentric path it has infolded all humanity and brought down blessings in showers like the Leonids of November, but more constant, admiration rises to veneration.

Peter M. Gideon came as near to being an exemplar of a practical altruism as any man I ever knew.

In the year 1884, in a summer visit at his Lake Minnetonka home, he showed me three very promising seedling apple trees in the State Experimental Orchard, of which he was the superintendent, under a small salary paid by the state. These three trees were then in full bearing, but their fruit not yet mature enough to show their color or quality. Waiting till the earliest variety would be ripe, I then persuaded the governor of Minnesota to go with me and see for himself what Mr. Gideon was doing to earn his salary, for a movement was already on foot to take it away from him.

Examining the trees again at this time, I saw an opportunity to help him make some money for use in his old age, and a few weeks later went back there backed by a responsible firm, and in

their behalf offered him fifteen thousand dollars for the exclusive right to cut scions from these three trees, which were clearly his own property, having been grown elsewhere on his own land before he had gone into state employment, and merely transferred to the state orchard for better observation of them.

What do you think his answer was? It was a kindly, but an emphatic, irrevocable NO. No nurseryman should hereafter have anything like a patent right on these or any others of his new apples. He would propagate them for himself and give them wide distribution to the people at as near cost as he could put them out, and not deprive himself of the right to give them to any one who could not afford to pay.

We all know how pertinaciously he carried out this benevolent intention. These Gideon experiment orchards are scattered all over the northwest. We are already hearing something from them.

There was a philosophy in his appeals to horticultural societies to regard the encouragement of more extensive home raising of all the good fruits as a means of the moral regeneration of society.

The proposed memorial is not needed to secure his fame. Some lovers and some destroyers of their race build their own monuments by their historic deeds. Mr. Gideon's monument is already up. Wherever stands a Wealthy apple tree—wherever a plate of this king of varieties is seen—the eye of the horticulturist will read on every tree and on every red-cheeked apple from it the name of Peter M. Gideon. How many more "star-pointing pyramids" his other new varieties are building for him we do not know, but Wyman Elliot, the messenger from Delphos, is said to be on the road this way, and there are whisperings of unveilings yet to be.

There is a parallelism between Shakespeare and Milton, and Gideon and the horticulturists. We could use his Wealthy apple tree to our own profit and without much compensation to him; Milton could borrow from Shakespeare and absorb from him without credit; but at least he could say feelingly as we now say in the same spirit of Gideon:

> "What needs my Shakespeare for his honored bones?
> The labor of an age in piled stones?
> Or that his hallowed relics should be hid
> Under a star-pointing pyramid?
> Dear son of memory, great heir of fame,
> What need'st thou such weak witness of thy name?"

But we will place this memorial, sacred to horticultural education, because it is our pleasure to do so, that the world may know he was honored in his own country and in his own state, by his

contemporaries. It is for this that I join you in placing the fresh and, I hope, imperishable garland of the proposed memorial upon his honored head:

I now offer the following resolution:

Resolved, That the executive board, in their discretion, be recommended to prepare and print an illuminated booklet, using as a standard of style the Roycroft publications; that it be limited to 1,000 or more copies and each copy to be numbered and certified over the autograph of the secretary; and that it be copyrighted in the name of this society.

That it contain about sixteen pages, as follows:

1st: A half-tone portrait of Mr. Gideon;

2nd: A half-tone portrait of Mrs. Wealthy Gideon;

3rd: A three-impression colored plate of the Wealthy apple;

4th: A list of Mr. Gideon's named seedling apples;

5th: A condensed biography of Mr. Gideon;

6th: A few pages of brief letters from horticulturists, not residents of Minnesota, relating to Mr. Gideon and the Wealthy apple;

7th: The imprint of the book shop doing the work.

And nothing more.

That the booklet be sold by the executive board or under their direction in such manner as they shall deem best, and the profits devoted to founding the proposed memorial at the State University of Minnesota.

Now I will give you my thought. All of you have heard of the beautiful work done by the Roycroft shop, its reputation for printing beautiful things. There is Elbert Hubbard's celebrated essay, "A Message to Garcia," in illuminated form (exhibiting volume), and the same form I would suggest here. We may not be able to reach the high standard of this volume, this vellum covered and silk-lined booklet. But that is for the executive committee to determine. Every copy issued will have its number, and the supposition is that many of our friends will be willing to pay a considerable sum for the first number.

Mr. J. S. Trigg (Iowa): While the state of Minnesota has all the honor of owning Mr. Gideon as one of its citizens, I beg to state that other communities outside of your state have an equal pride in honoring this man, and it seems to me that resolution should be amended and the number of copies provided for be enlarged. Every man in Iowa who raises a Wealthy apple tree will surely feel a great interest in the man who originated that apple, and if you only issue one thousand copies we will be unable to get any for Iowa.

Prof. S. B. Green: I would like to say a few words in regard to this matter. I think that example is much better than precept. That is why I spoke last night about the honor which was paid to eminent persons who had lived, especially in Europe. I showed you the statue of Liebig, the chemist. He was a professor at the University of Giesen, and there is a fine marble monument in the square to his memory. It is a goal for every boy to attain. I think

too much honor is often paid to money, that merit does not get quite its share of honor; and I think we Americans have been justly charged with the fact that we were rather inclined to honor the thing that glitters than that which was true underneath. I do not mean that entirely; it would be a slander upon myself and upon a great many high-minded men and women; but it is a fact that we do not go down to the bottom of these things and honor the thing itself, the example. Here is a man who started out in an original line. He is a pioneer; he laid out his own maps, and he did not know what harbor he was going to bring up in. He laid it out with his horticultural chart and compass, and you and I and many citizens are reaping the benefit of his labors.

I believe this is a good thing and I believe it is perfectly practicable. I will put in $25 myself.

There is another feature in this thing. It comes home to me personally, because at present I am professor of horticulture in the university. I know a thing like that would be a stimulus; it would be a good thing for all young men to have these matters spoken of. We have a new horticultural building at the experiment station. There are two brick piers in the class room having a face of two feet towards the class. It is the purpose to have brass plates placed on those columns with the names of eminent horticulturists on those plates,—to have them there as a sort of inspiration. If I were asked why the name of Epraim Bull was engraved on that plate I could tell them of the Concord grape. I could point out to them the name of Peter Gideon as the originator of the Wealthy apple. They would inquire about these things, and they are examples, thoughts, texts that will stimulate good thinking, high thinking, and I think it is a very good thing to have before the young. I would move the adoption of the resolution.

As to whether there should be more than one thousand copies issued, I think that matter can be left to the executive committee.

Mr. J. S. Harris: I will most heartily second the motion of Prof. Green, and I think in doing what we propose to do we are not only perpetuating Mr. Gideon's memory, but we are doing something by which thousands and tens of thousands of people coming after us who read and study his life may be stimulated in doing likewise. It will be doing something that will last after marble has crumbled to dust, and the study of the contents of that little book will also be a stimulus to make more and better horticulturists.

Mr. J. S. Triggs (Iowa): A leading fruit man in the city of Minneapolis told me not more than one hour ago that this apple, if raised in sufficient quantity throughout the northwest, would outsell the Rhode Island Greening, the Baldwin, Northern Spy or any other eastern apple.

The President: I inquired in Washington of different ones what the most popular apple was in their state. They named several, "but," they said, "there is a new one that we have got the last few years." "What is it?" "It is an apple called the Wealthy, and it originated in your own state." This little memorial book strikes me very favorably, indeed. It is a thing of beauty and will

be a joy forever, and every one of us will be proud to have it in his house. A real thing, a real gem, is worth more than a lot of trash. I would like to ask how many would be glad to have the chance to get one of those books when finished and offered for sale. (Almost every hand was raised.) What an endorsement that is. It seems as though every one in the house wants a copy. It is an assured success.

A vote being taken on Prof. Green's motion to adopt the resolution offered by Mr. Gibbs, the affirmative vote was unanimous.

The Secretary: I was standing at one time on Bridge Square when "Bill" King, as he was familiarly known, was alive. A farmer who had come to market with a load of produce had the misfortune to lose an ox, and a crowd was standing about expressing their sorrow over the situation and speculating as to how the man was going to get home. Just at that time "Bill" King stepped up and took in the condition of things, and he took off his hat, put in five dollar and passed it around, saying: "I am sorry five dollars; how sorry are you?" I am here to take down subscriptions to this fund, and I want to know "how sorry you are," or how glad you feel to contribute.

The President: I am like Othello, my occupation is gone, but I will be glad to go down for five dollars.

Mr. Wyman Elliot: We have an apple with us that is not shown on the tables that is equal to that (exhibiting a Wealthy), and I am not sure but what it will keep longer. It has been named the "Peter." It is a twin brother of the Wealthy, and I am not sure but what it is going to have a wider reputation than the Wealthy. I am willing to be glad to the extent of five dollars.

Subscriptions were then called for, and in twenty minutes the sum of $225 was pledged, apportioned among the following subscribers:

SUBSCRIPTION TO THE GIDEON MEMORIAL FUND.

Prof. Samuel B. Green, St. Anthony Park, $25.00.
W. W. Pendergast, Hutchinson, $5.00.
J. S. Harris, La Crescent, $5.00.
Wyman Elliot, Minneapolis, $5.00.
S. H. Kenney, Morristown, $5.00.
J. M. Underwood, Lake City, $10.00.
Mrs. Laura A. Alderman, Hurley, S. D., $5.00.
E. A. Webb, St. Paul, $5.00.
Mrs. A. G. Wilcox, Hugo, $5.00.
J. T. Grimes, Minneapolis, $5.00.
Chas. G. Patten, Charles City, Ia., $5.00.
F. W. Kimball, Austin, $5.00.
L. R. Moyer, Montevideo, $5.00.
David Secor, Winnebago City, $5.00.
D. S. Hall, Minneapolis, $10.00.
W. J. Tingley, Stillwater, $5.00.
A. W. Latham, Minneapolis, $5.00.
Clarence Wedge, Albert Lea, $5.00.

J. P. Andrews, Faribault, $5.00.
Thos. Redpath, Long Lake, $5.00.
R. W. Chapman, Plainview, $2.50.
Alfred Terry, Slayton, $3.00.
Andrew Wilfert, Cleveland, $3.00.
Thos. E. Cashman, Owatonna, $5.00.
F. L. Marsh, Champlin, $2.50.
A. H. Reed, Glencoe, $5.00.
D. M. Mitchell, Owatonna, $5.00.
Prof. N. E. Hansen, Brookings, S. D., $5.00.
H. M. Lyman, Excelsior, $5.00.
C. S. Hulbert, Minneapolis, $5.00.
W. L. Taylor, Litchfield, $5.00.
Chas. Hawkins, Minneapolis, $5.00.
C. F. Gardner, Osage, Ia., $5.00.
C. E. Older, Luverne, $5.00.
J. Beckley, Nerstrand, $1.00.
A. D. Leach, Excelsior, $2.00.
H. G. Acklin, St. Paul, $2.00.
W. H. Brimhall, Hamline, $1.00.
J. S. Parks, Pleasant Mounds, $1.00.
Jonathan Freeman, Austin, $1.00.
Mrs. D. W. Sprague, Minneapolis, $1.00.
J. A. Howard, Hammond, $1.00.
J. S. Jerabek, Silver Lake, $1.00.
John Penney, Cushing, $1.00.
C. G. Mattson, $1.00.
R. L. Daniels, Red Wing, $1.00.
E. R. Pond, Bloomington, $1.00.
Martin Penning, Sleepy Eye, $1.00.
A. W. Keays, Elk River, $1.00.
A. G. Long, Excelsior, $1.00.
D. T. Wheaton, Morris, $1.00.
Mrs. A. B. Kingsbury, Merriam Park, $1.00.
T. T. Bacheller, Minneapolis, $1.00.
Prescott, Wis., Horticultural Society, by Oliver Gibbs, $10.00.
W. S. Widmoyer, Dresbach, $1.50.
O. C. Gregg, Lynd, $5.00.

Seasonable Orchard Work.—No more profitable work can be done in the orchard during winter than to hunt up and destroy the eggs of the tent caterpillar moth. These are deposited during July in compact ring-like clusters of two or three hundred each upon the smaller twigs of the apple trees. After they are laid, the parent moth covers them with a viscid liquid which dries into a varnish-like substance that completely coats and protects the eggs from rain. These egg clusters are easily discernible in winter when the trees are leafless, and should be cut off with a pair of long-handled pruning shears and burned, thus preventing the ravages of the caterpillars in a most effective manner.

TRACING THE GIDEON APPLE SEEDLINGS.

WYMAN ELLIOT, MINNEAPOLIS.

Through the courtesy of Ansel Gideon, the oldest son of the late Peter M. Gideon, soon after the death of his father, I had access to the books and manuscripts left in the old homestead, and among them I discovered an old order book in which were recorded the orders taken for seedling apple trees that, during the years 1887-9, he had advertised for distribution to those who enclosed one dollar, to pay for packing, with an application for one hundred trees. For convenience in keeping a record of each lot of trees, I made a list of the persons ordering and numbered them consecutively from 1 to 231. I spent considerable time in locating the true post-office addresses of these persons, and found that they had a wide distribution, going into twenty-seven different states, from New Mexico on the southwest to Maine on the northeast, Pennsylvania on the southeast and Selkirk in the northwest, and into one hundred and sixty-one counties and two hundred and three towns. There never was, as far as we know, any effort made by Mr. Gideon or any one else to trace up the results to be expected from planting these seedling trees, distributed over such a large area, with a wide range of climatic influences and environment.

After consulting with the president, secretary and executive board of our society about the advisability of tracing up the results of this work, the following circular was prepared, containing twelve questions to be answered by the person receiving or the present owner of these trees:

INFORMATION WANTED AS TO THE CONDITION, FRUITAGE AND PRESENT OWNERSHIP OF CERTAIN SEEDLING APPLES, SENT OUT BY THE LATE PETER M. GIDEON, OF EXCELSIOR, MINN.

Please answer each question following, writing in the space provided after each question, and mail at your earliest convenience (using the enclosed enveleope), and you will assist the Minnesota State Horticultural Society materially in its efforts to secure hardy and valuable fruits for the northwest:

1. How many of Mr. Gideon's seedling apple trees did you receive, and in what year?
2. Were the trees in good condition when received?
3. Will you please give the names and postoffice addresses of any others you know who have at any time planted any of Mr. Gideon's seedling apple trees?
4. How many of the Gideon trees you planted are now alive and in good condition?
5. Describe the location where those trees were planted, particularly as to soil, subsoil, comparative elevation, direction of slope, protection from winds, etc.

6. How many of these trees are bearing fruit, and in what year did they commence bearing?

7. Are there any of these trees now alive and in good condition which have not yet borne fruit, and how many?

8. Are there any of these trees (judging from your experience with them) that are worthy of propagation? If so, describe them here, particularly as to hardiness and prolificness of tree, and size, color, quality, etc., of fruit, length of time it has kept, and method of keeping.

9. What success have you had in planting any kind of apple trees in your climate, and where were they propagated and from whom procured?

10. How do the trees from Mr. Gideon compare in hardiness and longevity with other varieties you have planted?

11. Are you growing other seedling apple trees that have promise of value? If so, describe them. (Note our offer of $1,000 for a seedling apple tree.)

12. If suitable money premiums are offered, would you be willing the coming season to forward to our society five specimens of each desirable kind of the Gideon seedling apples, for exhibition and examination? Our object in securing these is to compare your fruits with those of others who are growing fruit from seedlings sent out by Mr. Gideon, hoping thereby to gain some information which will be of value to the work of this society and to the public. Premium lists will be sent later to all who respond favorably to this question.

13. Please give here your full name and postoffice address.

In response to these circulars sent out there have been returned by the postoffice department as unclaimed fifty-four; twenty-three have answered without giving any information of particular value; forty-one have answered giving information that may be valuable if further correspondence is had with them. Those replying have now growing 1,999 trees, out of over 10,000 distributed, and of these 647 have not yet borne fruit, and their value cannot now be estimated. We have gained some knowledge respecting the vicissitudes which many of these trees underwent from delays in transportation, neglect in proper handling after arrival (some lying in the trench where bedded in one and two years) and in preparing the soil for planting; improper protection from injury by cattle, rabbits, mice and gophers, and gross mismanagement, and in many instances no care given, only planted in soil without cultivation, mulching or watering, with the inevitable attending result of total loss.

The planting of over 10,000 seedling trees that had been selected from many thousands with great care as being the best to send out over so large an area, with such a wide variation of environment, has led us to think that possibly there might be some kinds that

would prove of great value to northwestern pomology; but when we consider into whose hands they were consigned, with the probable ignorance of many of these would-be fruit growers as to the planting, care and management of fruit trees at that time (1887 to 1890), is it any wonder we find no better results? If these trees had had such careful handling, care and environment as the one hundred trees sent to Mr. T. J. Lightly, of Oakland, Freeborn county, Minn., the result would have proven far different. Here was an instance where intelligence was exercised, producing more fine varieties from that one order than from four-score of orders as ordinarily managed.

Out of this list of trees there are now growing twenty or thirty kinds superior to many of the named sorts under cultivation, some of which demonstrate the prepotency of the Wealthy to give a distinguishing mark to its progeny.

There are many valuable points of interest to the student in pomology in following up the history of these seedlings, often obtained through the helpful suggestions that come from thinking, practical people, that I would like to have said in this report. I think enough has been indicated of the importance of the work to awaken a desire for further investigation.

In looking over these seedling orders I discovered, listed with them, quite a number of named seedlings that Mr. Gideon had sent out from time to time, and as far as I am able to judge, the following are a list of what he propagated for distribution: August, Blood Red, Excelsior, Florence, Gideon, Gracie, January, Lou, Martha, Moulton, October, Peter, Rebekah and Wealthy. If there are other seedlings of his growing that have been named and distributed, parties having such information that is reliable would confer a favor by sending the name and where growing to our secretary.

REPORT OF COMMITTEE ON GIDEON SEEDLINGS.

WYMAN ELLIOT, CHAIRMAN.

Making an intelligent report upon the many seedlings and grafted varieties growing and fruiting upon the Peter M. Gideon farm would require more time than your committee has been able to devote to that subject in one season's examination. The chairman has visited the farm six times during the season, once with R. S. Mackintosh, from the State Experimental Station.

There are four orchards that have been planted at different times, and we will designate them by numbers, as Nos. 1, 2, 3 and 4, in the order in which they were planted.

No. 1 is nearest the house; No. 2 next to that, with a strip of timber intervening; No. 3 a little further to the west of No. 2, with forest trees interspersed, and No. 4 is north of this orchard, with only a road or driveway between.

No. 1 is largely planted with Mr. Gideon's named seedlings and varieties of his own raising. Many of the seedlings have been grafted with fall and winter varieties, obtained, no doubt, from many localities outside of the state. Some have been grafted long enough to come into bearing the present season, and among these are several varieties of value; one in particular, which appears to be root-grafted. There are four trees of this variety. The fruit is large, and when fully ripe quite attractive, of good quality, and the trees are very productive. The fruit was placed upon exhibition at our state fair, and the attention of every native fruit grower attending was called to this apple, desiring a name. After the fair specimens were sent to three expert growers of fruit in Iowa, and Stark Bros., Louisiana, Mo., and a specimen to Prof. Taylor of the Pomological Division at Washington, D. C. But up to the present time we have failed to learn the name or origin of this apple. It has the smallest seed of any large apple I have ever examined. There were two other large trees which bore striped apples, that were very attractive to the eye and of good quality. These Prof. Hansen has pronounced Mountain Beet. There were many other varieties of grafted apples in this orchard, scattered promiscuously among Wealthy, Peter, Gideon, Lou, October and other varieties of his own raising, and the inference is that they were so arranged for the purpose of pollination of the flowers, and from the fruit seed was to be selected for planting.

Orchard No. 2 is planted mostly with seedlings of his own growing, with here and there a tree with part of the top grafted with some other variety. In this orchard are crab trees growing that bear fruit no larger than a marrowfat pea and apples of good size, with a great variation in texture, color and flavor. One remarkable thing about the Gideon seedlings, wherever grown, is that they have the faculty of being very highly colored. We did not discover any apple in this orchard that was the equal of the Wealthy in size or quality.

Orchard No. 3 has over 2,000 trees growing and fruiting and contains a very heterogeneous mass of fruit trees, representing a wide range as to season, size, color and quality, very many of them very attractive with their coloring of red and gold, but lacking flavor and the other qualifications that would make them desirable kinds for further propagation. In the western end of this orchard are

several rows of trees of Russians and natives, the Wealthy and Peter leading as to productiveness and profit.

Orchard No. 4 is quite young, with a very few of the trees bearing for the first time this season. These are mostly varieties of his own raising, I should judge from the fruit growing upon them this year. There possibly may be many kinds of long keeping varieties planted among his own seedlings, hoping in this way to obtain seed from which he expected to produce the coming long-keeping apple which we are so anxious to have.

We have been well paid for our time and trouble in visiting the Gideon orchards, in learning somewhat of the value of this work which he has left unfinished for others to take up and carry forward, not only for the benefit of our own state, but of the whole United States and Canada. For northwestern pomology to receive the largest returns from this unfinished experiment these orchards should be critically examined by those competent to judge of the merits of their production for several years.

At our last state fair there were exhibited from the Gideon orchards over 150 varieties of seedling and grafted fruits, many of them of high quality and all very much admired for their high coloring and shapeliness.

One idea further and I shall close. The more I consider and examine into this experimental work of Mr. Gideon and think of its possibilities, I feel there should be some way provided or arrangement made to obtain this property and the orchard-ground for an object lesson of the persistent energy so devotedly done for the benefit of the coming generation of growers of fruit in our state. What better use could a few thousand dollars be put to for fostering this fast improving industry than in acquiring full and unlimited possession of these orchards, and engrafting the most modern ideas in its future growth and management, and I hope some wealthy friend of horticulture will earnestly consider, in his beneficence, the honor it would be to him to come forward and provide enough means to purchase this property and place its care and management with the Central Experiment Station, with the State Horticultural Society as advisers for the next few years, that a concise record may be kept of what is good and decide what varieties are best, what show qualities worthy of further propagation and dissemination. Those varieties that do not possess quality of fruit but have hardiness to recommend them for stock purposes, should be top-grafted with other good varieties, and in some few instances, perhaps, they might be

propagated for stock upon which to graft and bud half-hardy varieties that would not stand the rigors of this climate without this kind of management—or, perhaps, if this philanthropic friend cannot be found, our state legislature could be prevailed upon to make an appropriation sufficient to meet this contingency.

ANNUAL MEETING, WOMEN'S AUXILIARY.

MISS EMMA V. WHITE, MINNEAPOLIS.

One of the pleasant features of the winter meeting was the session prepared and presided over by the Women's Auxiliary. While some might consider the topics presented as relating more especially to the aesthetic in horticulture, still they were eminently practical, and such as should come properly within the scope of the society's interests.

The speakers were all prominent in the work which they represented, and were listened to with attention, many of the papers eliciting interesting discussions.

Miss Lucia Danforth, of Carleton College, gave an illustrated talk on the possibilities of beautifying country school grounds. Her plan was pronounced idealistic by some, yet she set forth a condition devoutly to be wished for and persistently to be attempted.

Mrs. Conde Hamlin, president of the Civic League of St. Paul, spoke of the out-door work accomplished by the league in the way of better sanitation and of adornment.

A paper on "Our National Flower," prepared by Mrs. Henry F. Brown, president of the Minneapolis Improvement League, was read, in which she suggested the maize as an appropriate national emblem, it being one of the few distinctly American products.

Prof. Maria L. Sanford, of the University of Minnesota, spoke on a subject of vital interest, "The Forest Reserve," referring especially to the efforts to establish a national park in the vicinity of Cass Lake.

A paper by Mr. Roy Underwood, of Lake City, related to beautifying the home grounds, and Prof. Wm. M. Hays, of the State Agricultural School, presented a practical plan, which is in partial operation, of teaching agriculture in the common schools.

As these addresses and papers will appear in the Horticulturist, no detailed account is needed here.

At the business meeting of the auxiliary an informal discussion on interesting children in horticulture brought out some pleasing and significant personal experiences. Mrs. Frances Town, by re-

lating the story of Peter M. Gideon, had so aroused the children of her neighborhood that they were planting every seed they could secure. This discussion led to the passage of a resolution indicating the desire of the auxiliary to undertake some systematic effort to foster the practice of horticulture among the children of the state. The matter was referred to the executive committee to formulate some plan by which this may be done.

The election resulted in reinstating the old officers, namely: President, Miss Emma V. White; vice-president, Miss Jennie Stager; secretary, Mrs. Anna B. Underwood; treasurer, Mrs. L. R. Moyer; executive committee, Miss Lucia E. Danforth, Mrs. Jennie Stager and Mrs. A. A. Kennedy.

ANNUAL MEETING, MEADOW VALE HORTICULTURAL CLUB.

A. W. KEAYS, SECRETARY, ELK RIVER.

At the annual meeting, held Oct. 27th, much interest was taken in fruit growing, although it is much harder to grow fruit in this latitude than it is farther south in the state, and we have many discouragements to meet. Still, we have learned many valuable lessons, and we have some valuable portions of our work left, that old King Boreas has not been able to destroy.

After the election of officers for the current year, a paper on grafting and budding the wild plum was presented by A. W. Keays, illustrated by actual work done, showing the fullest details for successful work and how a sour, worthless tree may be changed to one loaded with beautiful, sweet plums of the choicest quality.

A. C. McBeath, Fred Keasling and A. W. Keays were chosen as delegates to attend the annual state meeting in Minneapolis, Dec. 4 and 7. Several new members were added to the membership. A. C. Bailey was given charge of the agricultural and horticultural exhibit at the state fair in 1901.

The report from the trial station was also presented. A large number of people have visited those grounds during the past year to note the behavior of the different varieties of fruits on trial there. This report, with the other papers and discussions, will appear in the Horticulturist.

Secretary's Corner.

ANNUAL MEETING WISCONSIN HORTICULTURAL SOCIETY.—This Society has changed the date of its annual gathering and will convene this year at Oshkosh, January 14th to 17th.

ORCHARD CONDITIONS OF DECEMBER 14th.—"I have been looking over my orchard. No injury has occurred yet, and the young wood seems to be riper than when growth was stopped by frost."

J. S. HARRIS.

FINANCES OF THE SOUTHERN MINNESOTA SOCIETY.—This association is a long way from bankruptcy, the last report showing a balance of $66.25 in the treasury and no bills to pay. The management is to be commended.

THE DELEGATE TO THE NORTHEASTERN IOWA SOCIETY.—Mr. E. F. Peck, of Austin, consented to run the risk of being away from home over Thanksgiving and went as our delegate to the annual gathering of the above society. His interesting report is to be found in the next issue.

IOWA'S REPRESENTATIVE AT THE AMERICAN POMOLOGICAL SOCIETY.—We note that our fellow member, though an Iowan, Mr. Chas. G. Patten, has been chosen for the second time to represent the Iowa society at the biennial gathering of this great national organization, which convenes next summer at Buffalo.

DELEGATES TO SISTER SOCIETIES.—The following members have been appointed to represent this society at the annual meetings of our neighboring societies, viz.: W. W. Pendergast, to Wisconsin; Dewain Cook, to South Dakota; and Prof. Wm. Robertson to Iowa. Of these the Iowa meeting has already been held, and the delegate's report will appear in the next number.

ARE YOU WORKING—and will you send in at least one new member during this the first year of the new century? With the 1900 magazines you have to distribute and the help of the society folder, you ought to, to say nothing of the inducements offered to you in horticultural books as premiums for such service. Some one got you to join, and you thank them. Pass the obligation along!

THOSE SENDING NEW MEMBERS IN DECEMBER.—

J. P. Andrews, Faribault	3	J. S. Harris, La Crescent	1
Rev. M. Melinat, Webster	1	A. B. Franklin, Minneapolis	2
P. A. Henning, Zumbrota	2	W. W. Pendergast, Hutchinson	1
A. N. Wright, Excelsior	2	A. H. Street, Albert Lea	1
J. Longbittern, Seaforth	1	R. J. Mendenhall, Minneapolis	1
A. K. Bush, Farmers' Institute	15	Francis Davis, Goodhue	1
R. G. Benjamin, Hutchinson	1	C. M. Jensen. Albert Lea	1
G. D. McKisson, Charles City, Ia.	2	Paul Burtzlaff, Stillwater	1

When will YOU send one?

COMMITTEE ON THE GIDEON MEMORIAL FUND.—Pursuant to the instructions of the society, at the late annual meeting, the executive board has appointed Messrs. Elliot, Green and Latham a committee to make investigations as to the publication of the booklet in regard to the matter and settle upon a plan of procedure. In the meantime further subscriptions to the fund may be made to the secretary.

YOUNG MEN AT OUR MEETINGS.—It is a common saying at horticultural meetings that the young men are not there. This could not be said at our late meeting. There were a large number of young men in attendance and several young ladies, most of whom are members of the society and willing workers where opportunity offers. Our successors are being duly trained and with diligence.

HAVE YOU RECEIVED THE 1901 REPORT?—Unless specially asked for, reports are not sent out to members who were in attendance at the annual meeting, it being taken for granted that they were secured at that time. If you did not get one then and don't receive one about this time, please notify the secretary, at the same time giving your membership number. Reports are not sent out to members living in or near the twin cities, who can conveniently call at the office for them. Will you call for yours? It will save the society eighteen cents postage on each copy.

DO YOU WANT PLANT PREMIUMS?—A new list of plant premiums for the year 1901 has been prepared and printed in the 1901 folder and on the inside of the front cover of the magazine. If you want premiums the coming spring select them from this new list and notify the secretary, at the same time giving the number of your membership card, if you have received it. Select the premiums by number and not by giving the description of them, which will save the busy secretary much work. Two plant premiums are sent postpaid to each member, new or old, who applies for them.

WERE MISSED AT THE MEETING.—Among the regular attendants at our meetings who were missed from their posts at the late meeting are Mr. and Mrs. J. M. Underwood and Mr. E. H. S. Dartt. Mr. Underwood and his wife are visiting for the winter with his brother in southern California, and Mr. Dartt was kept at home by physical infirmities. The sympathy of the society was expressed towards the latter by suitable resolutions, while the absence of Mr. Underwood gave an opportunity for making him an honorary life member, which his long years of zealous service for the society richly deserved.

THE ANNUAL SOCIETY FOLDER.—A folder, similar to that issued in previous years, has been prepared and is now ready for circulation. They will be sent out, in limited numbers, with the membership ticket, and more will be supplied as called for. The nurserymen of the state could distribute large numbers of these with advantage, as they contain, besides a full description of the society and its workings, the fruit list and a list of ornamental trees and shrubs, this last list having been added this year for the first time. These will be found invaluable in securing new members, and the membership should use them freely.

"THE THIRTY-FOURTH ANNUAL MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY—which convened for a four days' session at Minneapolis, December 4th, marked the high tide of the prosperity of what is with-

out doubt the largest horticultural society in the west, if not on the continent The badge book, with name and number of each member intending to be present, was a new feature of the meeting and worthy of the adoption of all large societies. The badges worn by the members being numbered, a stranger could identify each by reference to his badge book, and get acquainted with those he desired to meet in an easy and informal way."—Orange Judd Farmer.

A FELLOW MEMBER'S MISFORTUNE.—The home of Mr. Clarence Wedge, of Albert Lea, was burned on the morning of Sunday, December 9. Most of the household goods were saved. We understand the building was fairly well insured. Mr. Wedge was making preparations to remove to the new nursery he located last spring a short distance north of Albert Lea. He is assured of the sympathy of all his friends in this misfortune.

A note received from Mr. Wedge since writing the above, says: "We are tolerably well settled in our new home now, a much larger house, fine barns and outbuildings."

AN EXPERIMENT STATION ON THE GIDEON FARM.—It has been wisely suggested that the state should acquire the farm and orchards of the late Peter M. Gideon and run the place as an experiment orchard under the management of the state experiment station. What more practical plan for prosecuting this line of work in our community could be devised than this? But how can the property be secured and working arrangements be made. This is the problem, and the thought of members of this society and of others interested in the pomology of the northwest is desired on this subject. Write the secretary, and let us exchange ideas in regard to this.

In this connection the following extract will be of interest: "There is much on the home grounds of the late Peter M. Gideon to testify to his life work, on which it is not an easy task to place an estimate. I wish your society or your state would buy that plant and place a competent man in charge of it. I believe there are seedling stocks there that should be grown and disseminated over the northwest for the sole purpose of top-working with choice winter varieties. I fruited Jonathan, Ben Davis, Malinda, N. W. Greening, Missouri Pippin, Wisconsin Spy and Gano, Newell's Winter, Milwaukee, Eureka, Herfordshire Pearmain, Blue Pearmain, Dominion Winter and Dudley's Winter—all winter sorts this season—top-worked on Virginia crabs."—A. J. Philips.

There have been two deaths in the honorary life list within a short time. That of Prof. H. W. S. Cleveland took place in Chicago early in December, the exact date not being known to the writer. He has been on this roll since 1888. For a number of years past he has resided with a son in Chicago. At one time in charge of the Minneapolis city parks, he has left his impress in a lasting way with us.

The death of Mr. Wm. Mackintosh occurred at his home in Langdon, in this state, on Sunday, Dec. 9th. He passed peacefully away to a well-earned rest. Mr. Mackintosh was made an honorary life member at the 1899 meeting, as a well merited distinction for many years' service with this society.

The usual biographical sketch for both of these departed ones will appear in later issues.

Oliver Gibbs,

PRESCOTT, WIS.

(See biography.)

THE MINNESOTA
HORTICULTURIST.

VOL. 29. FEBRUARY, 1901. No. 2.

Biography.

EX-SEC'Y OLIVER GIBBS,

PRESCOTT, WIS.

Oliver Gibbs, whose portrait appears as frontispiece in this number of the Horticulturist, was born in Bethel, Vermont, November 23, 1832, making him now in his 69th year. His father was born in Plymouth county, Massachusetts; his grandfather, Lemuel Gibbs, and his grandmother on that side of the house, born Hannah Putnam, were also Massachusetts people, although she was of the Connecticut Putnam stock, in the same family tree with Gen. Israel Putnam, of Revolutionary fame. His mother, born Zilpha Thomas, died when he was nine years old. She, as well as his father's people, had a long lived ancestry, but was herself a victim of the ignorance of the day concerning sanitary conditions and medical practice.

In 1833 his father and family removed to Pittsfield, Vermont, where Oliver was brought up, working on the farm and attending district and select school.

In 1850 and 1851 he taught in neighboring district schools; working as a printer in 1852 in the Herald office and in Geo. A. Tuttle's job office in Rutland.

In 1853 he tramped westward, setting type on the Troy Whig, Syracuse Journal and Chicago Democrat. In February, 1854, he tramped again, this time south, making short stops in Indianapolis, Louisville, Memphis, Vicksburg and Jackson, and getting a steady situation in the office of the Brandon Republican, Rankin county, Mississippi. Getting homesick for the north, he came back to Chicago, in July of that year, and till September, 1855, had employment as

compositor on the Prairie Farmer, himself and O. W. Wight, the editor, constituting the entire force on the paper; also as city reporter of the Chicago Times.

In September, 1855, he came to Prescott, Wisconsin, his present home, and entered into partnership with Charles E. Young in the publication of the Transcript, a weekly paper. In November, 1855, he was appointed clerk of the Pierce county board of supervisors, to fill a vacancy; elected in 1856 for two years; re-elected in 1858. In 1857, sold his interest in the Prescott Transcript.

In 1861 he was commissioned as Adjutant 2nd Battalion of the Second Wisconsin Volunteer Cavalry (Col. C. C. Washburn), and served in the Missouri and Arkansas campaigns till July, 1862, when broken in health by exposure and privation in the White River Swamps, under Gen. Curtis, and his office having been abolished by Act of Congress, he resigned at Helena on surgeon's certificate of disability and came home to Prescott.

In October, 1863, he was appointed temporary clerk of the paymaster general's office, War Department, Washington, and in the February following promoted to a regular clerkship, class 2, in the adjutant general's office and assigned to duty as confidential clerk to Gen. E. D. Townsend, acting adjutant general. In March following he was transferred to the office of assistant secretary of war, under Charles A. Dana, and promoted by him to class 4 of the War Department rolls, the grade next to chief clerk. His work here was to create and organize an office with entirely new duties growing out of the exigencies of the war. That office still survives, using the same system. He served in this position under Dana and Gen. Thomas T. Eckert, now president of the Western Union Telegraph Company, the last assistant secretary of war under the civil war regime, afterward serving with and receiving his instructions personally from Secretaries of War Stanton, Grant, Schofield and Rawlins.

In 1869, again broken in health and his family all reduced invalids from the malaria then prevalent in East Washington, he resigned and moved to Lake City, Minnesota, and tried gardening and small fruit raising. Here, through the friendship of J. M. Underwood, S. M. Emery and others, he joined the State Horticultural Society, of which he was secretary from June, 1882, till January 1, 1885.

At Lake City he passed (speaking after the manner of men) ten of the best years of his life afflicted by what was supposed to be an incurable disease, due to his army hardships and exposures in Arkansas, but yielding at last to a surgical operation.

In 1883 he made an exhibit of Minnesota fruits at the biennial meeting of the American Pomological Society, at Philadelphia, winning the Wilder medal, one of only four awarded on all the fruits of North America.

In January, 1884, he was appointed commissioner to represent Minnesota at the World's Industrial and Cotton Centennial Exposition, New Orleans. With the assistance of Gov. Hubbard he raised, by subscription, about $40,000, $28,000 in cash and the balance in property, to pay the expenses of the exhibit, the legislature at that time not having made an appropriation for the purpose.

With the consent of Gov. Hubbard he also served the exposition in a double capacity during the year 1884, up to December 1, the date of the opening, being, besides United States commissioner for Minnesota, the special commissioner of the exposition for Michigan, Illinois, Wisconsin and all the other northwestern states and territories through to the Pacific, excepting Nebraska. Nearly two years were spent by him in this business, closing it out in the fall of 1885 and escaping into South Dakota used up physically and threatened with complete nervous prostration. In the quiet and seclusion of farm life in a Dakota gulch, he recovered in about three years.

In South Dakota Mr. Gibbs was an active member of their State Horticultural Society, and while in Dakota was made an honorary life member of the Minnesota Society, on motion of the veteran J. S. Harris. His South Dakota residence was Ramsey, McCook county. He was president of his town and county Farmers' Alliance and of the McCook County Agricultural Society.

In 1891-2 he was chosen general manager of the South Dakota State Columbian World's Fair Commission and secretary and superintendent of the same commission as reorganized in 1892; planning and collecting the state exhibit and establishing its relations to the exposition, including the state building and the several state department exhibits of his state. He also organized the Woman's Commission for the state; but failing in health he resigned in December, 1892, going to Florida to recuperate.

In 1896 he was elected to the South Dakota legislature and served during the session of 1897.

In the fall of that year he returned with his wife to their old home at Prescott, where they now reside in good health.

In June, 1856, Mr. Gibbs was married to Rose Martin, of Williamstown, Vermont. They have five children living: Zilpha T. Converse, Palatine, Ill.; Charlotte M. Cobban, Minneapolis; Nettie M. Jackson, Ramsey, S. D.; Margaret E. Schmitt, Minneapolis, and B. O. Gibbs, Rock Island, Ill.

His career as a horticulturist can be partially traced in the records of the American Pomological Society, the Mississippi Valley Horticultural Society and in various state societies, and in gardens in the places where he has lived. He has not been so much of a grower of horticultural products as an organizer, stimulator, interpreter and torch bearer for others.

LAKESIDE HOME OF OLIVER GIBBS, AT PRESCOTT, WIS.

As secretary Mr. Gibbs issued two annual reports, each one some three times as large as previous annual reports, made possible in part by an Act of the Legislature providing for the society printing. As an officer he served the society with great fidelity. This pleasant official relation was only severed when he was called to a position of higher responsibilities, for which his natural qualifications and previous training well fitted him.

In retirement, in the restful years of his later life, at his old home on the banks of the St. Croix River, just over the line in Wisconsin, Mr. Gibbs is serving the society with the same earnest faithfulness as in the days of his active official relation to it. A good leader is also a good worker in the ranks, and the subject of this sketch is seen to be both. This society has asked many services of him, and experts to ask many more during the period of years in which we hope he may long be spared to us.

A. W. L.

ANNUAL REPORTS,

Trial Stations, 1900.

CENTRAL TRIAL STATION, ST. ANTHONY PARK.

PROF. S. B. GREEN, SUPT.

The peculiarities of the past season and its unusual severity have somewhat interfered with the best progress of work at the Experiment Station. Last winter was unusually injurious to the tender roots of plants, and, as a result, we have considerable winter-killing of cherries, of one-year root-grafts and of blackberries. Some of our grape vines, too, seemed to be somewhat injured. The unusually severe drought of the spring and early summer had a very injurious effect upon seeds sown and plants set out in the early spring, and the unusual amount of water and mild weather in the latter part of the summer and in the autumn has had the effect of continuing growth very late, so that many varieties of apples and many of our shrubs have not as yet shed their leaves, showing a rather immature condition of the wood.

In spite of these disadvantages, the orchards, nurseries and grounds of the University Farm are in very good condition and have given us some interesting lessons. The large apple trees, which were transplanted in the thinning out process in the old Russian orchard, on the Experiment Station grounds, one year ago, have done very well. The small fruit crops, including currants, gooseberries, raspberries and strawberries have been fairly good, although all of them were somewhat injured by the very dry weather which prevailed when they were ripening. Blackberries were a total failure with us, owing to severe winter injury, but enough sprouts have started from the roots so that we have a fair stand of plants, which makes it desirable to continue the plantation as it was. The new vineyard fruited very well this year, and I am especially pleased with the Beta grape as a variety for general planting, knowing, as I do, its great hardiness. The bunches are all good sized and very often shouldered. The fruit is medium in size, quite acid, but of good quality.

The seedling orchard has produced a few fruits, but nothing of any consequence. This seedling orchard, it should be remembered, is grown from seed of our most promising hardy varieties, and but few of the trees are old enough to produce fruit.

It is our intention to work up stocks of those varieties of plants that are new and not as yet offered by the general nurserymen, provided they have some qualities that recommend them for planting. Carrying out this idea, we have grown several thousand seedlings of Acer ginnala and of its parent, Acer tartarica. Seedlings have also been raised of the common thorn apple, sheepberry, Russian olive, wahoo, Pyrus baccata, high-bush cranberry and the Japanese lilac. About 400 seedlings of the Beta grape have also been raised. At the suggestion of some of the members of the horticultural society, this department bought all the seedlings which Mr. Peter M. Gideon had at his experiment station at the time of his death, something over a year ago. These consisted of about 2,100 plants. About 1,000 of these were used as premiums for the horticultural society members, and the other 1,100 were planted on the grounds here for trial.

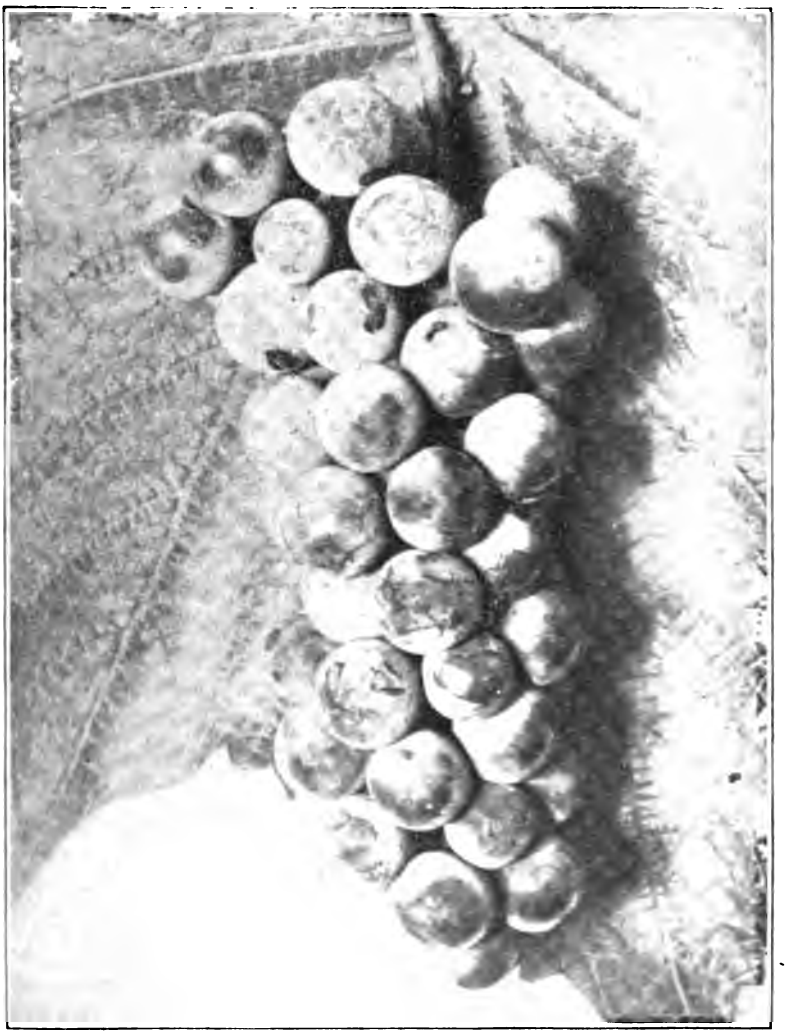
Several years ago Mr. Wyman Elliot sent to the Experiment Station a small package of high-bush cranberries, which he selected from the plants that had borne most heavily in the vicinity of Lake Minnetonka that summer. From these about sixty good plants were raised. They fruited to a small extent in 1899, and this year bore a heavy crop, producing the largest fruit that I have ever seen. We shall continue this method of selection and planting, to see what may be developed from it.

A new line that has been undertaken the past year has been the planting out of samples of hedge plants. In this planting about twenty-seven kinds have been used, including both evergreen and deciduous trees. Most of these have started well and will soon begin to make a good showing, and I think we may expect interesting results from them.

Among the trees and shrubs that have been recently introduced, and are attracting attention on our grounds on account of their desirability, may be mentioned a dwarf prunus from Japan, which has a very small, shiny leaf and lies nearly flat on the ground. The Alpine currant, which I believe I have referred to in a former report, still maintains its reputation for hardiness and fresh green color and good form throughout the summer and late autumn. It seems to be especially desirable for planting along the edges of shrubbery or for a division line between city lots. It readily takes on a pretty

dwarf form, with its branches close to the ground, and I think should be more commonly grown by our nurserymen.

Our cherry trees promised a crop when they were in flower, but shortly afterwards showed weakness, which, on examination, it was



BETA GRAPE.

clear resulted from winter injury to the roots, and we got very little fruit of good quality and lost some trees.

The vegetable crops upon the farm were exceedingly good, especially in the case of onions and potatoes. In the case of the onions, I lay our success largely to the fact that the seed was in the

ground before the dry weather of the spring. Some of our experiments with the spraying of potatoes for the prevention of mildew have given results which seem to show that, at least in some years, this treatment may be profitable, and our experiments with fungicide, to prevent scab on potatoes, show that it is seldom, if ever, that the potato grower can afford to neglect this precaution.

The interest in forestry has been greatly enlarged in the last few years, and the forest garden at the Experiment Station is of increased interest as the years go by, due partly to the fact that as the trees get older they teach more object lessons, and partly to the fact that people are beginning to understand these matters better. It is my intention to increase the amount of instruction offered in forestry in the College of Agriculture, so that it will make a much more thorough course, and, as one of the means to this end, we have recently laid out on the farm a square acre containing something like 400 trees for lessons in scaling in timber, and some of the best trees on the grounds have been numbered and are to be measured each year and the increase figured. I believe this is a move in the line of practical forestry that may be of far reaching importance and will make our work much more practical than heretofore.

It is interesting for me to note that there has been quite an increase of interest taken in horticultural matters by the superintendents of the university sub-experiment stations, and I think it will not be long before we shall get good results from all of them, and as they are now located in sections which are not covered by any of the trial stations of the horticultural society, they should add very much to our data regarding the horticultural possibilities of this state.

EUREKA TRIAL STATION.

C. W. SAMPSON, EXCELSIOR.

Grapes and small fruit plants came through the winter (1899-1900) in very poor shape. Grape vines especially were badly root-killed. Some vineyards were almost entirely wiped out. The cause was no snow, and the ground was frozen very deep. Strawberries were almost an entire failure except where they were irrigated. Raspberries were about half a crop. Currants and gooseberries were a fair crop. Apples and plums both bore heavy crops of excellent fruit.

Campbell's Early was our best grape this season. They have come to stay, and the vine is very hardy and vigorous. The grapes will hang on the vines and to the stem for four weeks after ripening.

They ripen about with Moore's Early, Aug. 25th with us. Its bunch is large, black, with a beautiful bloom; flavor rich, without foxiness; flesh a little meaty, sweet to the center, with small seed, parting freely from the pulp; skin thin but tenacious; hanging to the vine without dropping its berries and remaining in sound condition until severe frost strips it of its foliage. It is really an improved Concord.

Dracut Amber is one of our early grapes to ripen. Vine vigorous, healthy and hardy; very early and productive; bunch large and long, compact, often shouldered; berries large, round; skin thick, of pale red color; pulpy and a little foxy. Is a very nice table grape.

Woodruff's Red. The vine is vigorous, short jointed, healthy and very productive; of iron-clad constitution. Its foliage is very healthy. Bunch and berries are very large and attractive; in color similar to Salem. It ripens early and is a good long keeper, and does not crack nor drop from the stem.

Wilder. This is one of the best and most popular of the black varieties for the market. Bunch large, often shouldered, sometimes weighing a pound; berry globular; color dark purple, nearly black, slight bloom; resembling black Hamberg. For general cultivation in Minnesota, I would recommend planting Campbell's Early, Moore's Early, Worden, Delaware, Massachusetts, Janesville, Concord, Lady, and the Iona in favorable locations. The young vines should be covered with dirt and also a mulching of coarse litter over the roots for the first three years. The first year I let them run on the ground, the second year train them up a pole six feet high, and the third year train them on a wire trellis. Grapes should be set in rows eight feet apart and eight feet in the row.

EXCELSIOR TRIAL STATION.

H. M LYMAN, SUPT.

Owing to the very dry season, young trees made but slow growth till the latter part of the season, when an abundance of rain fell, causing them to start a vigorous growth which continued up to the middle of November last; therefore, they have gone into winter quarters in a very poor condition to withstand an extreme degree of cold. Though, if we have a winter as mild as last winter was, there will probably be no winter-killing of the tops; and if the present snow remains none in the roots. There was no snow here last winter, therefore young trees (and some older ones) were injured, and many in the nursery were killed by the deep freezing

of the ground. I put a mulch of straw manure around most of my trees in orchard, which saved those that were so treated; but the few that were left made a poor and sickly growth, and several died. The nursery trees were plowed between the rows late in the fall, which protected them to some extent, and there was but little root-killing. Some of them were also mulched, and of those none were injured.

The apple crop was large, but owing to the great change from extremely dry to very wet during the ripening season, causing the trees to make a new start and an overflow of sap, they are not keeping as well as usual. I expected that it would cause blight, but this season has been the one most free from it of any for several years. There was a little of it seen here on the Longfield and Yellow Transparent in the nursery, but none on the larger trees of those or any other variety—none even on the Transcendent.

We have several seedlings which have borne for the first time this year—one very promising one. It is in the third generation from the Wealthy. It is a large sweet apple, red, and fine in quality. Of the many seedlings that I have raised from the Wealthy (seed planted in 1876), nearly every one is of good size—some of them larger than the Wealthy, most of them as large. Many of them will keep as long as the Wealthy, and there are several varieties that will keep much longer. The Peerless is proving better than I once thought. It has fruited well the past season. The trees will rank in hardiness fully with the Wealthy.

Our Prolific crab is still proving itself true to name by bearing heavy crops of apples. This year we picked from it thirty bushels.

We had a large crop of plums; trees loaded to breaking. The Forest Garden, Wolf and Stoddard were fine and large. They were not overloaded like the De Soto. The Mankato is a choice plum when matured, but most of them rotted on the trees. I think quite highly of the Compass Cherry. Young trees were loaded with fruit. Its quality is quite good to eat from the hand, and it makes excellent sauce; also the tree is perfectly hardy.

LA CRESCENT TRIAL STATION.

J. S. HARRIS, SUPT.

We have not very much of interest to report at this time. The winter of 1899-1900 was not severe enough at this point to test the hardiness of the previous season's growth of any but the very late growth that was made on trees that were so severely injured in the

previous winter that their growth was all made very late in the season. An examination of such trees made late in November, before winter had fairly set in, showed some discoloration under the bark of some varieties at the union of the new growth with the older, unsound wood, and a few such trees were found to be entirely dead at the opening of last spring. A rain occurred on the 9th and 10th of December (1899) that wet the soil to a depth of four or five inches, and was followed by a snowfall of nearly two feet, so that frost did not penetrate the ground to any great depth, and no root-killing occurred in the orchard or to the undug trees in the nursery. Notwithstanding, we had a severe lesson in root-killing. Some 2,000 nursery trees had been dug and buried while the ground was yet dry and came out with the roots nearly all dead, while a few hundred others dug later and only indifferently heeled in, came through uninjured. The buried trees were in an exposed place and in rather light soil, where the snow was blown off; while the heeled-in trees were left between rows in the body of the nursery.

The early spring was backward, and the ground was well saturated with moisture from the melting of snow and moderate rains and continued too wet to work nicely through the most of the month of April, and the weather between the 16th of April and 3rd of May was warm and favorable for the starting of vegetation. Quite severe frosts occurred on the mornings of May 3rd, 4th and 5th, at which time native plums were generally in full bloom, and either from the effects of the frost or because there were no insects about to aid in pollinization, but little fruit set, and the larger part of that which did set, except De Sotos, was destroyed by curculio before fully grown. Following these frosts, the weather became very warm for the season, and on the 13th of May the thermometer indicated 90° in the shade. Apple trees came forward rapidly and bloomed fully as early as usual. The amount of bloom was wonderful, and the setting of fruit large; so large that but for the quantity that fell in the usual June drop it would have been disastrous to the trees. Still, after the heavy drop nearly all varieties were loaded to their fullest capacity at mid-summer, when, with many varieties, a second dropping began. The Walbridge, Fameuse, Westfield, Shockley, Utter, Scott's Winter, Malinda, Anisim, Plumb Cider, Virginia crab and a few seedlings, were about all of the varieties that were hanging on well at the beginning of September—and these were mostly down before the 10th of October. The Tetofsky and Duchess were fit for use when the second dropping began, but decay followed the dropping so close that much of the fruit was lost before it could be got to market, and the best would not bring the prices of first-class

hand picked fruit. The varieties of the Anis family (Russian), which all promised a large crop, began to fall about the middle of July, before much more than half grown, and by the 20th of August there was not enough left upon the trees, even of the latest, such as Kursk Anis and Russian Green, from which to select specimens for the state fair. The fruit could not be sold at any price in the home market, although I considered it of better quality than the Duchess. It was off too early in the season to ship to markets where it would sell, and the crop of twenty-six large trees proved nearly a total loss. The Antonovky and Okabena were ripe and nearly gone by Sept. 1st, and the Wealthy came to maturity fully a month earlier than in average seasons. One-half of the crop fell to the ground during the last week of August, and it was with difficulty that any were kept through September. Even the Walbridge, Shockley and other long keepers are not keeping well.

NEW VARIETIES OF PROMISE.

The Gideon apple fruited heavily this season, hung on well until the Duchess were all gone and took well in the market. The fruit is of good size and fair appearance.

I have only one tree of the Deoma. It produces large fruit, much like McMahon in appearance, and bears very heavily on alternate years. The fruit hangs to the tree better and keeps a month later, while the tree appears to be equally as hardy and less subject to blight. I do not think that it is being propagated by nurserymen.

The Daisy, which originated at the same time and place as the Okabena, fruited well this year. It is proving to be a fall apple at my place and but little later than the Okabena. It is a very handsome, medium sized, pale yellow apple, with blush cheek; flavor, sub-acid, good; use, dessert.

The variety that I have been growing as T. J., No. 4 fruited well this season. The fruit is of medium size, smooth, round oblate form; color, greenish yellow and red striped; flavor, rich sub-acid; season this year, October. I have given it the name of "Johnson's Favorite," in honor of the originator, the late Tolus Johnson, of Houston county. I saw the original tree last August. It appears to be in perfect health and was bearing a crop of about twenty bushels.

The side hill orchard, which I began planting in 1896, now contains 800 trees of apple and plum, in about 200 varieties. The trees have not yet produced much fruit, but the majority have so far stood well and are looking well. These trees are largely of Rus-

sian and new western varieties, many of them yet unnamed and of recent origin. As fast as any varieties prove to be worthless on account of tendency to blight or tenderness of trees they will be taken out and replaced with others, and hardy varieties bearing undesirable fruit will be top-worked to better varieties. The Russian varieties, Enormous, Gipsy Girl, Sklonka, Swedenser, Ostrohoe, Stupka, Sweet Pipka, Sacharine, Sladanka and Red Repka, will be grubbed out the coming spring, and it is not unlikely that the Yellow Transparent and others of that family will have to go the same route, on account of their blighting proclivities.

In the older plantations about 150 varieties fruited this year. About one-half of the bearing trees were sprayed with a solution of Paris green in water, 1 pound of Paris green to 200 gallons of water, a pound of quick lime being added to the mixture. These trees were sprayed once immediately after the bloom had fallen, and a few of them a second time a few days later. The result was very marked in the reduced number of wormy and knotty specimens at harvesting and the greater amount of perfect fruit. A few trees that had been sprayed the previous year were even better than those sprayed for the first time this year. A portion of the plum orchard was sprayed at the same time, but showed no perceptible difference in the quantity or quality of the fruit produced or in the health of the trees.

New varieties added for trial this year were Nelson, University, and Lyman's Prolific, and in the nursery grafts were set of the Homer No. 1, Hamburg, Long John and Thayer.

The results of the last season, through the effects of drought and the excessive early dropping of fruit, and size, color and quality, do not favor as close planting as many of our people recommend and practice. Had I land to spare the closest that I would plant would be two rods apart each way, but I think that equally as good results may be obtained by planting the trees twenty feet apart in the rows and forty feet between the rows.

Our raspberries and blackberries were not given winter protection. Black cap raspberries, with the exception of the Older, were considerably injured, and the crop was light and poor. The Ohio has done so poorly a few years past that I do not think it worthy of farther planting. The Cuthbert (red) was somewhat injured, but produced a very fair crop. The Loudon is still doing well, and the King is very promising. Among the newer currants the Moore's Ruby, Pomona and Red Cross have so far done the best.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

Strawberries. For market purposes Bederwood and Warfield gave the best satisfaction; Splendid and Brandywine did well and are worthy of further trial; Wm. Belt and Marshall yielded lightly, and quality inferior. Red raspberries, except the Loudon, were a failure.

Black caps: The Palmer, Gregg and Nemaha gave a fair crop; Conrath of no value. Blackberries: Snyder and Ancient Briton did well. Currants: Red Dutch and Victoria were very fine. Grapes: The only grapes on the premises were from a row that was not cut back nor laid down. The intention was to dig them out, but the work was not done, and a fine crop was the result—an exception to the general rule. The question is, what part of the other process was responsible for the failure, whether of improper trimming or unseasonable covering or raising up?

The only cherry trees bearing a crop were the Wragg and one or two Russians.

Apples were abundant and of good quality, though hurt by hail. Special mention should be made of the Wealthy, Okabena, Anisim and Hibernal; also some seedlings of the Wealthy.

Native plums were a bountiful crop, the third consecutively. Among the varieties entitled to special mention as newly fruiting were the Brittlewood, Hunt, and Bursota. These attracted unusual attention from their large size and fine appearance. There were received for trial the Ames' Hybrid, the Splendid, the Hammer and the Free Silver, from Iowa; the Wittmann, the Gray, the Odegaard, the Blackhawk, the Combination, the Chenebot, Yellow American, Zee and Stella.

J. W. Kerr, of Maryland, says in his report of Japan plums that last year they all rotted on the trees, and science informed him that the rotten fruit must be carefully gathered and destroyed to prevent after contagion, but the work was not done, and this year he has a fine large crop, free from rot. At this station last year a few Gaylords, Hawkeye and Ocheeda rotted on the trees. They were carefully gathered and destroyed by picking from the trees and off the ground, and this year I had no trees out of seventy-five in bearing that were entirely free from rot, from which I infer that climatic conditions are responsible for rot. In this connection I would also state that none of my trees produced this year any pods or plum pockets.

MONTEVIDEO TRIAL STATION.

LYCURGUS R. MOYER, SUPT.

APPLES.

At Montevideo the apple making the best record was the Wealthy. It had been supposed that we were too far north and too far west to raise the Wealthy, but for the last two years it has been doing surprisingly well. People are beginning to plant apple trees, and it seems likely that the whole Minnesota valley will before very long produce its own supply of apples.

The Hibernal, too, is making a good record, and young trees are bearing large crops of apples. The fruit is rather sour and a little coarse-grained, but it is better than the Missouri Ben Davis, that seems to have such a firm grip on the Minnesota market for a fall apple.

Among the very new summer apples, the Blushed Calville easily stands at the head. It is a very fine apple, but why the name is prefixed with the adjective "Blushed," is most difficult to understand. Our trees were received from Prof. Budd and ought to be true to name, but they do not betray the slightest tendency to blush. On the contrary, one would call it a very light yellow or white apple without the slightest tinge of red. The Blushed Calvilles began to ripen with us about July 20th and were at their best about August 4th. The trees seem to be very hardy and quite free from blight, and they are regular and abundant bearers. The trees come into bearing when they are very young, and the fruit is of high quality. The Blushed Calville is a Russian apple that one does not have to apologize for.

No. 1 Simbrisk is a large apple of fair quality, ripening a little later than the Oldenburg. It does not seem to be a very heavy bearer.

No. 984 appears to be an excellent, medium sized apple ripening in September. The apple is splashed with red, but the flesh is white and of very fine quality.

Another apple of fine quality ripening in September was received from Prof. Budd under the name of Prosart's Malenka. We shall watch its development with interest.

The Whitney bore a large crop in this neighborhood.

An apple sold by Storrs & Harrison, under the name Gideon, seems to be very hardy. It is a large sized yellow apple ripening in October. It is very sour, but is a good cooking apple.

PLUMS.

The plum crop at Montevideo was almost a failure. A spring frost shortened the crop, and much that remained was diseased and bitter.

LILACS.

Here in western Minnesota the lilac still maintains its reputation as the best flowering shrub. The lilac mildew was noted to some extent, but did no serious damage. The varieties growing at the station are: Syringa vulgaris and its varieties, Syringa vulgaris alba, Charles XII, and single and double Russian, Syringa Persica, Syringa Persica alba, Syringa Japonica, Syringa Josikaea and Syringa villosa. This last species is very distinct in its habit and looks more like an ash than a lilac. It blooms three or four weeks after the common species and thus prolongs the lilac season. Syringa Japonica is doing well but has not yet bloomed.

OLEASTERS.

Nothing that has been planted on the prairies of western Minnesota seems more at home than the so-called Russian olive, Elaeagnus angustifolia. It is a large shrub or small tree with beautiful silvery leaves and very hardy. Its bloom is very odoriferous. At Montevideo the station grounds are more than 100 rods from Windom Institute. Last spring the Windom preceptress declared that she could smell the odor of the oleaster at Windom. She had been familiar with the perfume in Persia, where the tree is common, while a missionary there, but had not seen an oleaster tree since she left New York. On inquiry she found that the oleaster trees at the station were in bloom, and that the winds had brought their fragrance to her.

Elaeagnus argentea seems to be quite common in the Red River valley and in North Dakota, but so far we have failed to get it established here. The last lot sent out from St. Anthony Park appear to be Elaeagnus angustifolia.

BUSH HONEYSUCKLES.

The several varieties of Lonicera Tartarica are among the most desirable border shrubs for planting in western Minnesota. The flowers of the typical species are red. The white flowered form is known as var. alba. According to Bailey, the form sent out by Prof. Budd as Lonicera gracilis should be known as var. parviflora. It has small pure white flowers. The form sent out by Prof. Budd as Lonicera splendens, with large flowers of deep pink color, is var. speciosa. With us it is the finest of them all and should be widely planted.

The little trailing honeysuckle from Turkestan, known in this state as Lonicera Albertii, should be called Lonicera spinosa. It is a very small shrub and very hardy; but its native habitat is lofty Alpine summits, and it does not seem to be entirely at home on the prairies. It needs to have the dead branches cut away every spring. It should be set in front of the shrubbery or in a bed with perennial flowers, where it will not be over-topped by more robust growing species. Its flowers are very fragrant.

Lonicera Morrowi and Lonicera Ruprechtiana have been planted at the station and seem to be hardy, but they have not yet begun to bloom.

Our native species, Lonicera dioecia, develops finely in the shrub border, and should not be overlooked by any one searching for beautiful things to plant. This species belongs to the climbing section of the genus, but in this climate is rarely more than a bushy shrub.

Few of the climbing honeysuckles seem to be hardy enough for western Minnesota. Lonicera Sullivantii was received from Prof. Budd under the name Lonicera flava, and is doing very well. It is a fairly good climber, but the flowers are not fragrant. This species is a native in some parts of Minnesota.

BARBERRIES.

Berberis Amurensis does not differ greatly from Berberis vulgaris, but is somewhat more robust in habit and better adapted to prairie planting. Berberis Canadensis, as received and planted at this station, proves to be only Berberis vulgaris. Nurserymen should be held to a stricter accountability.

CHERRIES.

The sand cherry, Prunus pumila, does not seem to do very well on the dark clay loams of western Minnesota. We have lately planted the western sand cherry, Prunus Besseyi, and hope for better results. A wild sand cherry on the rocks at Ortonville appears to be this species.

There is a great deal of variation among the choke cherries of western Minnesota, and it seems likely that some of them will turn out to be the western choke cherry, Prunus demissa. Prof. Sargent is of the opinion that the two species intergrade, and that they may as well all be included in one species. Certain it is that there is vast difference in the quality of the fruit produced. We may reasonably expect that in the future a valuable fruit may be produced from the choke cherry.

The native wild red cherry, Prunus Pennsylvanica, does well in the shrub border and is hardy anywhere in western Minnesota. It grows wild on the rocky ledges in the upper Minnesota valley.

Prunus Maackii, from Russia, is with us one of the most desirable early spring flowering shrubs.

ALMONDS.

The dwarf almond, Amygdalus nana, keeps up its reputation as a very early spring flowering shrub of the first order of merit. Its bright pink flowers are very striking.

PEA TREES.

We have to continue our good reports as to Caragana arborescens, Caragana frutescens, Caragana Chamlagu, and Caragana pygmaea. The first is a small sized tree; the last is a low dwarf shrub. All are very desirable, and in late spring when they are covered with yellow bloom they are a rich and beautiful sight. The dwarf species are easily propagated from sprouts and root cutting. They do well in any dry soil, where other things would fail.

MOCK ORANGE.

There is much confusion as to the nomenclature of the different species of Philadelphus. We have heretofore reported that Philadelphus coronarius is not so hardy as some of the other species. It is the fragrant species and the earliest that we have. Ours have now been standing about fifteen years, and although we frequently have to cut away dead wood, they were this season better than ever before. The Philadelphus sent out by Prof. Budd as 144 Vor. continues to make a good record and is one of the best. Young bushes of Philadelphus speciosus are doing well. Those purchased many years ago as Philadelphus grandiflorus and Philadelphus Gordonianus are still with us and blooming every year, although they are in a crowded border where they do not have sufficient room to develop. The golden Philadelphus has disappointed us.

SPIREAS.

Nothing stands higher among spring flowering shrubs than spiraea Van Houtei. It is superb. Spiraea hypericefolia blooms somewhat earlier and is very hardy. It is not so showy, but is very desirable.

PLEASANT MOUNDS TRIAL STATION.

J. S. PARKS, SUPT.

The past season has been a peculiar one for the fruit grower of our section on account of:

1. The continued dropping of apples during the growing season.

2. The late growth of apples after the ordinary growth had been attained, when several varieties, notably the Walbridge and Wolf River, made a large increase in size after the late fall rains had started vegetation growing rapidly.

3. The rapid decay of apples, a serious loss not common to this state.

4. Injurious insects have been more troublesome than heretofore and warn us that we have them to fight vigorously hereafter.

Pyramid of Wolf River apples, shown at Blue Earth County Fair in 1900. J. S. Parks, the grower and H. C. Hataling, the supt., stand just behind them.

The late growth of our trees has left a heavy growth of unripened wood that we fear will not be in condition to stand the rigors of our ordinary winter.

Very little experimenting has been done at our station this season. We have noticed for several years past that many nurserymen advised planters to set trees in the fall, and in most cases the

result has been dead trees. Last fall we secured a few trees from a near-by nursery and carefully planted half of them and heeled in the balance. In the spring we got a few more trees as a spring delivery, and at once set them and the heeled-in trees. The result is, that nearly every one of the fall set and the spring delivered trees are dead, while the trees heeled in through the winter have made a good growth and look promising. The trees were several varieties of apple and twenty varieties of plums.

J. S. Park's apple exhibit of 200 varieties at Blue Earth Co. Fair, in 1900.

One of the two seedling trees from the Gideon homestead has made a satisfactory growth; the other is sickly and not likely to live. Owing to my inexperience in this business and the late setting apart of our station, I am not prepared to report on individual specimens, which I hope to do hereafter.

SAUK RAPIDS TRIAL STATION.

MRS. JENNIE STAGER, SUPT.

Last spring all vegetation started beautifully. The trees blossomed and the birds sang. Then came a severe frost which killed not only blossoms and leaves but, in some cases, the trees also. The frost seemed to move in waves, taking sometimes two and three rows and leaving other rows entirely unharmed. So we were not bereft of all. The plum orchard, on a northeast slope, escaped all harm. After this came a long continued drought, which lowered our hopes to zero. The first of June we had a good rain and then another drought, but we were surprised with a fine crop of

large strawberries. We had mulched them quite late and heavily, as there was no snow, and owing to an overplus of work in the spring had failed to take the mulching off. The outcome was a full crop.

Raspberries bore much later than usual, lasted longer and were a good crop. Other bush crops bore well. The currants were small. Old grape vines came out all right, but young ones died. Spring flowering bulbs, with the exception of German iris, failed to bloom, but all fall bulbs made up for it with a wilderness of blossom. Caladium esculentum was especially magnificent, and, strange to say, our evergreens made an abnormal growth.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

The drought which threatened the destruction of all crops in this vicinity was broken about June 20th. Since that time we have had an abundance of rain. Our strawberry crop was very light; the rains came just in time to prevent its being a total failure.

Our Juneberries, which I have been growing about fourteen years now, were a fine crop; we gathered about fifteen bushels. They are about as sure a cropper as any fruit I know of, having failed to produce a good crop only once during that time. We also had a very fine crop of seedling sand cherries. The fruit from a large portion of them was so bitter and astringent that I considered them worthless and grubbed them out. However, about twenty-five per cent of them could be used for jelly and sauce, and out of the 400 bearing bushes we got two or three that I consider good. They were tender, juicy and sweet. As this fruit is so hardy, can be so easily and cheaply grown, I predict that the coming cherry for the prairie section of the northwest will be the dwarf sand cherry improved by selection.

The plum crop was extra good. Our bearing trees had been well mulched with long stable manure, and we used a curculio catcher with great success. There was no dropping of immature fruit. Our earliest plum to ripen was one of the Manitobas, sent me some years ago by Thos. Frankland, of Stonewall, Manitoba. It is a rather small freestone of the Weaver type; ripened July 25th, and is of a beautiful cranberry color.

The following varieties have given good satisfaction this season: Cheney, Forest Garden, De Soto, Wyant; also the freestone Wolf and the clingstone Wolf, the Hawkeye and the Stoddard. The last named variety is the largest plum I grow.

I want to call attention to the Marcus plum from northwest Iowa. It is of large size, etc.; season, a little later than De Soto. Its strongest point is its deep red color while the fruit is yet hard. It also keeps in condition for marketing a long time.

The New Ulm rots so badly year after year that we will have to discard it. The Mankato and Wood plums also rotted badly. The Rockford is so small and scabs so badly that we have no use for it.

Owing, no doubt to my getting after them with my jack-knife, we had less borers in our plum trees than usual, and the birds took the most of them. We also lost a few trees of our hardiest varieties of plums last winter by root-killing.

Our crop of apples and crabs was very good. The Early Strawberry was the first crab to ripen; tree a great grower, great bearer and seems well adapted to our windy prairie. The Florence has proved my most profitable crab for market. I think it should be more generally planted. The Martha makes a good tree for a windbreak, but at this station as a fruit producer it is a failure. The Virginia is disappointing in that it does not bear enough fruit. The Sweet Russett gives good satisfaction.

Of apples, the Wealthy and Duchess head the list for profit. The Breskovka proves to be valuable; it is about one week earlier than the Duchess. For extra early the Tetofsky has not yet been superseded here, although Juicy White and Red Duck, of the Transparent family, are very promising. For a fall apple I am very much pleased with the Lubsk Queen; it has such a deep red color; trees bear quite young. The Okabena has proved an early, heavy and reliable bearer. Patten's Greening seems well adapted to our prairie soil but has not borne as heavily on young trees as has some of the other varieties. The Malnda top-worked is quite promising for a late apple, although our seasons are hardly long enough for it. Some of the fruit I neglected to gather is still hanging on the trees at this date, Dec. 2nd.

The foliage of our apple trees the past season has been remarkably free from fungous diseases, and the tree hoppers were not as bad as usual.

The trees ripened up their wood in good shape and are now full of fruit buds for next season's crop. This is especially so of the Wealthy.

More foliage is still clinging to our apple trees than is usual at this season; the Wealthy and some other late fall, also some early, varieties have nearly their entire summer foliage still upon the trees.

The only blight we have had this season was on our only Smitza tree, that was badly attacked in June. It was promptly cut down and burned. Also our only tree of large Siberian crab, that was attacked with body blight late in October.

I omitted to mention that a few Wealthys that were evidently root-injured the winter of '98-'99, bore an extra heavy crop of fruit this season and dropped their foliage earlier than usual.

Of evergreens, the Scotch pine seems to be the pioneer, growing early and rapidly, without much regard as to cultivation. The white and black spruces do very well here. The Norway spruce is not quite hardy, although we have some good specimens.

The native, or northern, red cedar, where well cultivated, grows very rapidly and will rank with the Scotch pine in value as a windbreak, and stands drought much better.

The Black Hills spruce seems to be our hardiest evergreen, but on account of its extremely slow growth I doubt its ever being popular except as a lawn tree.

The following varieties are also doing very well here: silver spruce, Douglas spruce, arbor vitae, Platt River cedar, silver cedar and Austrian pine. The white pine lives but does not grow much; it is not a success here.

It seems almost absolutely necessary to succeed with any of the evergreens that they be planted where they will be somewhat sheltered from our heavy prairie winds; the more shelter, the greater the success in that line.

I omitted to mention that I have by deep planting of my apple trees about prevented their root-killing, which is so prevalent in this section every winter.

We sympathize with both nurserymen and planters because we have no hardy stock for our apple-roots, but the nurseryman who sends out plum trees on tender roots should, we think, be turned over to the tender mercies of his victims.

MEADOW VALE TRIAL STATION.

A. W. KEAYS, SUPT., ELK RIVER.

(Read at Annual Meeting of the Meadow Vale Horticultural Club.)

After the experience of the past winter we have learned that the ordinary apple seedling root, Pyrus malus, is worthless for stock in this section unless heavily protected by mulch. We lost over 5,000 trees from root-killing, in all sizes from bearing trees to last season's root-grafts—Duchess, Hibernal, Virginia all went out in the general wreck. But I have a few left. In '96 I became convinced

that the trouble with trees killing was due to the tender roots; so I tried some experiments in root-grafting, and this fall I have Charlamoff, Longfield, Hibernal and Wealthy bearing, and the trees from which the cions were taken are all dead. This method of grafting brings trees into bearing very early, only four years from root-grafts, and makes a strong, healthy tree that will stand the test winters, but is harder to work than the ordinary method. Such trees could not be sold for less than $1.00 each. The root of a tree is not as hardy as the body or limbs. Wishing to bring some seedlings into early bearing I worked them on large trees and the cions grew, but the seedling trees from which the cions were taken never showed any life. The past winter (1899-1900) was mild, only 27° below zero, but the ground was bare a greater part of the winter, and apple roots were killed about ten inches deep. The best protection I have tried is six inches of strawy manure and four inches of dirt on top, around each tree as far out as the branches extend.

Those twenty plates of small apples you see before you are seedlings from Transcendent seed; they are all small, but there are some nice little eating apples among them, but the best part of them is that they have a hardy root under them. Not one of them was injured in the least the past winter. They come into bearing early and are strong growers; I shall work a number of our large apples on them next season for experiment. Those small yellow crabs are the true Siberian. I know these roots are all right, for we have old trees thirty-five and forty years old that are sound today and bearing immense loads of fruit. I have in hand a number of experiments with those also.

The cherries all went out except those I had worked on hardy stock, and those were in bearing this summer. Our orchard is in a very severe situation, exposed to the north and west winds and very low. We had thirty varieties of cultivated plums in bearing this season, which gave us eleven bushels of very fine fruit. Several seedlings came into bearing this year; three of those are valuable. One is a late, blue plum and very fine for sauce and canning, medium size, very early and a good bearer. The Sweet Gage was in bearing this season. This was sent me from Canada. It will be very valuable here if the tree proves hardy. It comes into bearing early.

Another fruit is in bearing this year, which is late, a good bearer, has a peculiar pleasant flavor, very different from the plum, and has a pit like a hybrid cherry. It is the best cooking plum we have tried. I have a box of the fruit kept in a common cellar in good condition until Oct. 20, and expect to have some at annual meeting. All plums

worked on native stock are hardy here, but those worked on southern stock are worthless.

We have some seedling apples that are good keepers, good quality and a very hardy tree. The golden Russian willow is a fine thing and should be largely planted. It makes a good windbreak. The laurel-leaf willow, with its dark green shiny leaf, is very popular for a shade tree. The weeping willows are not hardy here. Catalpas kill back some but are gaining every year. They do best in a sheltered location. The Russian mulberry has been fruiting several years in this vicinity. Among the evergreens on trial that are doing best here are red cedar, arbor vitae, silver cedar, mountain pine, white pine, blue spruce, white spruce, Douglas spruce and Scotch pine. It pays well to have evergreens mixed among the orchard trees. I find them a good protection for the trees, also being very ornamental.

I am also keeping cases of apples, including all the new seedlings, trying their keeping qualities.

ANNUAL MEETING, 1901, MINNESOTA STATE AGRICULTURAL SOCIETY.

OLIVER GIBBS, PRESCOTT, WIS.

The three-day annual meeting of the State Agricultural Society at St. Paul, the second week in January, was distinguished by the high practical character of the papers read and addresses delivered. It is to be regretted that the society has no means of getting these contributions to knowledge read by the people at large, beyond the meager reports of an already over-crowded newspaper press, and it also seems unfortunate that this society and the State Horticultural Society do not have it arranged to meet at so nearly the same time that they can intersect in joint convention at least one day or half day.

Perhaps, if one were called to name the very brightest features of the meeting, where all were bright, the ones pointed out would exactly agree with the general opinion, and the mention would be Archbishop Ireland's magnificent address on farm life and how it can be made more attractive and prosperous to prevent the overtrend of the young people from the farm to the cities; the discussion between Supt. O. C. Gregg and Prof. Thomas Shaw, on the law of sexual influence in cattle breeding; Gen. Mark D. Flower's paper on home feeding of beef and mutton and the relations of home stock yards to the Minnesota farmer; Dean W. A. Henry's half hour's address and additional hour's enforced talk in answering questions

on the effect of different kinds of feed on the pork products and pork markets, his observations in Europe, etc.; J. W. Scott's "Experience of a Young Stock Breeder;" "Dairying in Minnesota," by Prof. T. L. Hecker; the brilliant talk of L. H. Kerrick, of Illinois, on breeding and feeding beef cattle; and the evening session at the capitol with the students of the School of Agriculture, demonstrating the progress and influence of training in farm business, including domestic economies at that school.

The business session Thursday morning resulted in the re-election of Hon. John Cooper as president, and Thos. H. Shevlin, of Minneapolis, and Chester R. Smith, of St. Paul, as vice-presidents; Col. W. M. Liggett to succeed himself as a member of the board of managers for three years, and Mr. W. G. Sawyer, of Partridge, Pine county, to succeed J. H. Letson in a similar capacity, the latter declining to serve longer in the position he has filled with zeal and fidelity for a long term of years.

The utmost harmony prevailed in all the deliberations of the meeting, and its results augur well for the future success of the state fair, whose conduct it is especially the province of this society to foster.

The meeting wound up with a resolution instructing the board to make arrangements to report the next annual meeting and have its proceedings printed.

ANNUAL MEETING, NORTHEASTERN IOWA HORTICULTURAL SOCIETY, 1900.

E. F. PECK, AUSTIN, DELEGATE.

Believing that the trite saying, "It's the early bird that catches the worm," might with a great deal of truth apply to the early delegate in news-gathering, we boarded the 7:45 p. m. train at Austin and arrived at Iowa Falls, and subsequently at the Woods hotel, shortly after one o'clock on Tuesday morning, Nov. 27th. After displaying our best sample of chirography on the register, we called for a bed and were somewhat taken aback by the announcement "Everything here is full."

We were shown to a room two blocks away, where with J. B. Mitchell, the veteran horticulturist of Cresco, and F. G. Barnard, district director, of Waukon, we passed the balance of the night.

The society held no session in the forenoon, and we shook hands and got acquainted with the district directors and many other prominent horticulturists and were made to feel that we were at home, and this feeling stayed with us during all the sessions, and we con-

sider the meeting a very profitable and pleasant one to all participating. The attendance was not as good as might be wished, but the spirit was admirable.

The fruit exhibit, consisting of some seventy-five varieties of apples, was much ahead of the display of the Southern Minnesota Society at Austin, but that was to be expected. The southern Minnesota people are working to the Iowa model, and there is no feeling of jealousy.

President Gardner, as full of vim and vigor as ever, was promptly on hand, as well as vice-president Reeves, Secretary True and Treasurer Ivins. The secretary had everything in readiness to move when the president called the meeting to order at 1:30 p. m. The session opened with prayer by Rev. G. B. Shoemaker, of Iowa Falls.

The executive committee, recognizing the mistake in calling the meeting to last over Thanksgiving, facilitated matters by the announcement by the president that all papers sent in by members not in attendance would be filed with the secretary and not read, which would shorten the program so that members would be able to reach home in time for turkey.

Reports from district directors regarding the fruit crop, market prices, condition of orchards and nursery stock were read, and although the same condition was reported to exist throughout the several districts as in Minnesota as regards late growth of trees it was the opinion of all that the orchards were in good condition to go into winter.

Elmer Reeves, expert orchardist, of Waverly, ruled that the clinging of the leaves of the apple tree was more of a mechanical connection than a natural one. Treasurer Ivins, of Iowa Falls, exhibited cuttings from several different varieties of apple trees, which, after a careful examination by members present and just as good authority as the state can produce, were pronounced in a perfectly healthy condition.

The report of district directors was so complete that there was very little discussion, and at 3:30 the meeting adjourned until 7:30 in the evening for the purpose of giving those who wished an opportunity to visit the fruit farm of Mr. Ivins. Comfortable conveyances were soon at the door, and all took passage, and—with the exception of your delegate—a finer looking lot of men never took part in any parade.

We are glad to report that the society found his orchards and nursery in an exceedingly healthy condition, notwithstanding the soil and location was not one best adapted. It is an ideal small fruit

chance, and the fact that the orchard is doing so well is proof positive that no one risks anything in planting the hardier varieties of apples and plums on any soil that will raise timothy hay or small grain on any location anywhere in northeastern Iowa or southeastern Minnesota. To be sure, the orchard may not be as long lived as in some of the "down east" localities, but it will prove a good investment just the same. Everything about the premises showed the careful management of a skillful workman, for Mr. Ivins works with his hands as well as brain and is doing the community a great service, which we hope he finds appreciated in the substantial way it deserves. Mr. Ivins is very enthusiastic in his praise of some of the varieties he is propagating, especially of apples. The Arctic he claims perfectly hardy with him and that it has a record of all the qualities that go to make a No. 1 apple as far north as Crookston in this state. It originated in New Hampshire. He has also the Aport, the Adamson and the Boikin, all of which have a great future with him. We noticed the thriftiness of these varieties in the nursery row, especially the Arctic. Some specimens made a growth the first season of five feet, and the whole row would average over four feet and as smooth and clean as a bullrush.

We doubt if money would have bought them, yet at the close of the meeting every one who wished, brought away scions of those valuable varieties, which had been cut at the proper time and properly labeled, a free gift from Mr. Ivins. He is a veritable home missionary. May his tribe increase!

Tuesday evening's session was well attended, opening with music by a quartet of Iowa Fall's sweet singers. Address of welcome by Mayor Williams was hearty and earnest and brought down the house. The responses by the Rockford editor, J. S. Trigg, voiced the sentiment of the visiting brethren and put every one in the best of humor.

The program was fully carried out. Elmer Reeves, of Waverly, J. C. Ferris and S. W. Ferris, of Hampton, all prominent orchardists of northeastern Iowa, filled in the time with interesting papers along their line of work, and many timely hints were dropped by the way.

The Wednesday morning session opened with prayer by Rev. J. Mulholland. The president's address was nothing more or less than what every one that knows the gentleman has come to expect, a mesage of wisdom and good counsel.

W. A. Burnap, of Clear Lake, insisted in his most emphatic manner that the time is here and cannot longer be delayed that we come to some understanding in regard to the Northwestern Greening. Either recommend it or warn against it. He called for the

opinion of every member in the house, which brought on quite an animated discussion, but was soon settled by a vote, four out of five recommending it.

J. L. Herbst, of Sparta, Wis., and superintendent of trial orchard at Wausau, reported the ten acre orchard there in a very promising condition, especially Longfield, Northwestern Greening, Patten's Greening and Windsor. The Virginia crab is the best stock for top-working. All withstood the rigors of winter of '98-9 without noticeable injury.

J. S. Trigg told how a family could be supplied with fruit from a town lot, and those who were skeptical before the discussion had their doubts removed at the very start when the Rockford editor and horticulturist ruled that pieplant is fruit, and apportioned six hills to a small family, which if properly cared for would furnish pie and sauce in season and enough to can for winter. This with a variety of other fruit, which might easily be grown on a large town lot, made the solution of the problem quite easy.

Afternoon. Eugene Secor, of Forest City, named his favorite shrubs and flowers, and while there are many things that are new and novel and nice, with names almost unintelligible, Mr. Secor still stands for the old fashioned lilac, snowball, syringa, tree honeysuckle, white and pink, the peony, dahlia, tulip, gladiolus, pansy, sweet pea, etc., and made us think of the old song, "There's no friends like old friends."

W. H. Guilford, the Dubuque Sunday school teacher and acknowledged authority on grapes and cherries, got the floor several times during this session and always found eager and attentive listeners. He preaches the gospel of horticulture with a zeal that carries conviction with it—a genuine encyclopedia of knowledge—revised to date, from preface to appendix.

The evening session opened with music. A very valuable paper on "Plant Breeding" was read by A. T. Erwin, a young man from the Ames School of Agriculture, and the subject was well handled. Many of the old heads absorbed information that they had never before been able to obtain. The young student is on the right track, and will be heard from later.

The three days' program was worked off in two days, and all went home with new energy, with greater earnestness and more enthusiasm and a determination to make the influence of the horticultural society appreciated and honored by every one. It was a genuine love feast from start to finish, and your delegate can truly say that it was good to be there. We were, by a unanimous vote,

made an honorary member of the Northeastern Iowa Horticultural society early in the session, tendered the freedom of the city by its chief executive, royally entertained at the best hotels, and got back across the state line without being missed.

IOWA STATE HORTICULTURAL SOCIETY, ANNUAL MEETING, DEC. 11 TO 14, 1900.

PROF. WM. ROBERTSON, ST. ANTHONY PARK, DELEGATE.

Iowa is divided horticulturally into four districts, each district having its organization auxiliary to the state society. Each holds meetings and discusses questions affecting its particular territory. Each receives aid from the state society to the extent of $150, with a proposition at the last meeting to make the amount $200. Through these auxiliary societies, the horticulturists make their greatest effort to reach the people of the state. This, along with the fact that the State Agricultural Society was in session at the same time in the same building, the state capitol at Des Moines, may explain why Iowa's winter meeting was not so largely attended as we expected, and why the fruit exhibit was so very limited.

You can imagine our surprise to hear several enthusiastic speakers proclaim that "Iowa is the greatest agricultural state in the Union," when we have been told the same thing of Minnesota so many times from the platform that we had come to think that nobody disputed the question.

Iowa's membership is made up largely of men of long experience in horticultural lines; consequently, the papers read and the discussions offered were very interesting and valuable. Many of these men are, and have been for many years, doing original work in the line of hybridizing and selecting, also growing seedlings, to improve the quality and durability of our fruits.

Very interesting in this line was a paper by N. K. Fluke, of Davenport, a resident of Iowa for fifty years, a very modest man, but a persistent and enthusiastic experimenter. Wishing a large blackberry easy to cover, Mr. Fluke pollenized Snyder, Ancient Briton, Erie, Wilson's Early, etc., with the Lucretia dewberry. Of fifty seedlings obtained, three were dewberry in character and never amounted to anything. The others varied from the dewberry to a blackberry as strong as the Ancient Briton. Of these, twelve were selected for trial. The canes grow to the height of two feet and run off on the ground to a distance of ten to twenty feet. Samples of these plants were shown by Mr. Fluke. Root cuttings made from these, and, after a year, set out in an exposed situation for fruiting.

were killed down the following winter, but have come again from deeper roots and have produced some fruit of good quality.

Mr. Fluke has also done extensive work in hybridizing the Mercer county wild crab with Ben Davis, Duchess, Jonathan and Maiden Blush; always using the crab as female and the cultivated apple as male parent, that there might be no mistake or question in regard to results. The seedlings from these crosses have not yet fruited, but scions worked into the tops of other trees have fruited and given encouraging results. The trees, Mr. Fluke says, show in growth many characteristics of the male parent. Mr. Fluke's plan, I believe, is to further improve these seedlings by continuing the crossing, always using the malus or cultivated strain as male parent. Those interested can get scions by sending to Mr. Fluke at his home. This is a field in which there are certainly great possibilities.

Mr. Fluke has also grown fifty native crosses of Weaver, De Soto, etc. All have fruited, and some are equal to any in cultivation.

The sentiment in Iowa, judging from Mr. Wragg's paper on plums, seems to favor a return to the American varieties for general planting. Much stress was laid upon the fact that plum fruit quality may have all kinds of variation, due to the character of the root they are on. Top-grafting and close planting were emphasized as necessary for good pollination and consequent fruiting. The Iowa horticulturists have not much time for the insect as a pollinator, crediting most of the work to the wind, and claiming that we shall not miss the bee in that line when he is gone.

Mr. Reeves of Waverly wishes to go on record as disputing the claim that seeds, as the cherry, blackberry, raspberry, elderberry, etc., will germinate after passing through the alimentary canal of a bird.

G. S. Bacon, of Des Moines, would have the Warfield and some other strawberries give way to the Splendid, Bissel, Wolverton and Enhance. The Morgan, Ridgeway and Sample he is not ready to recommend. He does not regard the Kenyon raspberry equal to the Loudon or Cuthbert.

C. L. Watrous, of Des Moines, spoke very highly of the work being done by Theodore Williams, at Benson, Neb., in the line of hybridizing plums and cherries. Mr. Williams says it is a lonesome plum tree in his orchard that does not have from three to five varieties grafted into the top. Much top-grafting is done by small boys. The results were astonishng, when Mr. Watrous was there in fruiting time.

The horticulturists of Minnesota will do well to keep an eye on a seedling called the Windsor, fruit of which was exhibited by F. O. Harrington, of York Centre, Ia. The first premium for seedling was given to Underwood No. 4.

M. J. Wragg, of Waukee, was elected president of the Iowa society for the coming year, and "The Fruitman," of Mount Vernon, was made the official journal.

Many other interesting things might be told of the Iowa meeting, but it would make this report too long. Your delegate was royally entertained at the Kirkwood, heard some very complimentary remarks in regard to the Minnesota Horticultural Society, and all in all had a very pleasant and profitable time.

ASPARAGUS RUST.

PROF. S. B. GREEN, STATE EXPERIMENT STATION.

Recently rust has made its appearance among the asparagus beds of Minnesota. This disease has been known for five or six years in Massachusetts and New York, where it has occasionally done very serious injury. It has been known, however, for a very long time in Hungary and various portions of Europe. The effect of the disease is to cause the tops to turn brown in August or, perhaps, as late as the first of September. In consequence of this, the roots fail to ripen up well, and only a very inferior growth of sprouts is secured. The disease seems to be most serious upon beds that are located on dry soil, where they will suffer for water. On rich soil and where they have good cultivation, they are not nearly so liable to injury. The practice of spraying with Bordeaux mixture has failed to give good results; likewise the cutting and burning of the tops to destroy the infected plants. At present it would seem that the best method of treatment is to grow asparagus on moist soil and to give the very highest cultivation.

In Europe, where it has been known for a long time, it is seldom injurious. An interesting thing in connection with this disease, which may account for the fact that it is seldom injurious on its home ground, is that this parasite has another parasite which feeds upon its spores and destroys them and in this way keeps the disease in check. It is quite probable that this parasite of the rust may be introduced into this country to work in its beneficial way, as it has in parts of Europe.

ANNUAL MEETING, 1900, MINNESOTA BEE-KEEPERS' ASSOCIATION.

L. D. LEONARD, SEC'Y, MINNEAPOLIS.

The Minnesota Bee-Keepers' Association met Dec. 5th, 6th and 7th, at the same time that the horticultural society was in session.

The executive committee, consisting of Mr. H. G. Acklin, Mr. Van Vliet and Mr. Wm. Russell, had arranged a program, which resulted in one of the best meetings ever held in this state. And let me say in passing that the bee-keepers appreciate the action of the horticultural society in securing for them a hall in connection with their own, printing programs at small cost, and securing reduced railroad rates; and the kindly feeling that goes with all this, and the courteous attention paid to any subject presented to them from the bee-keepers' standpoint, makes the relation one that calls for any good office that may be in the power of the Bee-Keepers' Association to do.

The president, J. P. West, of Hastings, who has held the office for several years, was absent on account of sickness, and G. H. Pond, of Bloomington, first vice-president, took the chair.

The morning of the first day was devoted to reports of committees and officers, most of which had to do with the regular order of business. There was a special committee, however, which had been appointed to act in conjunction with the State Dairy and Food Commission to the end of suppressing the sale of adulterated honey, this being one of the most important questions affecting the industry of bee-keeping. A considerable time was devoted to its discussion. It developed that in the last two years 150 samples of alleged honey had been analyzed, 25 per cent of which was proven to be adulterated. Most of this spurious honey (made of glucose) was traced to three or four wholesale grocery dealers in Minneapolis and St. Paul, who evidently have determined, in spite of the law to the contrary, that the people shall have pure glucose, worth one cent a pound, when they want pure honey, and think they are getting it when they pay ten or more cents a pound.

There have been several retail dealers prosecuted and fined for selling this adulterated honey, and it will not be long before the makers will be called to time.

The adulteration of food products must cease, and the strange thing about it is that old established firms will stoop to so low and paltry a fraud.

In the afternoon a joint meeting was held with the horticulturists, at which the literature relating to "The Mutual Relation of

Bees and Horticulture" was reviewed by L. D. Leonard, and a paper from President West on the same subject was read.

The papers read during the following meetings were the President's Address, "Shipping and Selling Honey," by Mr. Longfellow, of Minneapolis; "Work of Dairy and Food Commission," by Mr. Corbett, of Minneapolis; "Cooking with Honey," by Miss Moeser, Minneapolis; "Disposing of Our Home Crop to the Best Advantage," by G. H. Pond, of Bloomington; "Bee-Keeping near Duluth," by Dr. Mary McCoy, of Duluth; "Migratory Bee-Keeping," by George A. Forgerson, of Farmington; "Premiums at Our State Fair," by Wm. Russell, of Minnehaha Park, and "Bee-Keeping for Pleasure," by Dr. E. K. Jaques, of Crystal.

The question box, under the supervision of Mrs. H. G. Acklin, of St. Paul, is a decided feature of the bee-keepers' meetings. Most of the questions pertain directly to the bee-keeper; there are some, however, which are of general interest. One of these is "Is the mammoth clover a good honey plant?" The answer was that a second crop will often yield honey while the first will not. "Is there foul brood in this state?" No one at the meeting knew of any. "What plants can be sown for bee-pasturage?" Answer: "Sweet and alsike clovers."

Communications received from the representative of the Pan-American Exposition regarding the exhibition of the products of the bee-keeping industry in Minnesota were placed in the hands of Dr. E. K. Jaques, of Crystal, who, in conjunction with the executive committee, will have entire charge of all arrangements pertaining to such exhibition.

Dr. Jaques is well qualified for this office, as his former experience shows, when he was in charge of the Minnesota honey exhibit at the Trans-Mississippi Exposition at Omaha. Minnesota at that time made one of the best, if not the best, honey exhibits of any state. We hope other organizations will communicate with our committee to the end that Minnesota will be in the front rank in all its exhibits at the Pan-American Exposition at Buffalo.

At the last meeting the election of officers resulted in the following:

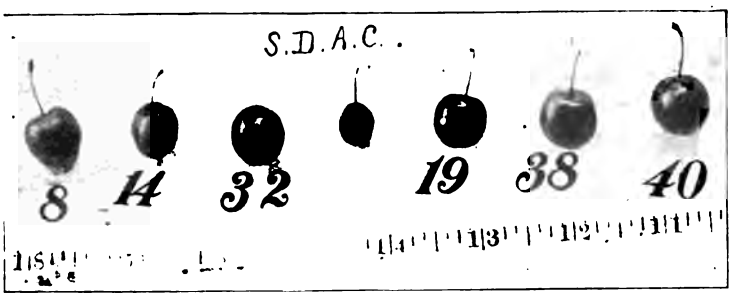
President, Wm. Russell, Minnehaha Park; first vice-president, G. A. Forgerson, Farmington; second vice-president, G. H. Pond, Bloomington; third vice-president, Dr. Mary McCoy, Duluth; secretary, L. D. Leonard, Syndicate Block, Minneapolis; treasurer, L. E. Day, Farmington; executive committee, H. G. Acklin, chairman, St. Paul; H. B. Van Vliet, Farmington; Dr. E. K. Jaques, Crystal.

THE BREEDING OF NATIVE NORTHWESTERN FRUITS.

PROF. N. E. HANSEN, S. D. AGRICULTURAL COLLEGE, BROOKINGS, S. D.

All who are familiar with the severe conditions with which the planter has to deal who lives on the open prairies of the northwest must realize the urgent need of a hardier list of fruits than we have at present. Before this association there is no need of going into details concerning the great annual losses experienced on the prairies by those attempting to grow many kinds of fruit. Five years ago, upon first coming into the state, my general knowledge of the conditions induced me to make a beginning in this work by gathering together wild fruit plants and trees from various parts of North and South Dakota and Manitoba. The determination to follow out this line of work was greatly intensified by attendance upon numerous farmers' institutes and by the many letters received from farmers who had failed in raising eastern and southern fruits. The work of raising seedlings was begun as soon as these plants began to fruit to any extent, which was in 1898. All the plants in fruit were carefully gone over, and the seeds saved from the plants bearing the largest and best fruit. Seedlings were raised the following year and during the past season. A careful count this fall shows a total of over 27,000 seedlings, made up in round numbers as follows:

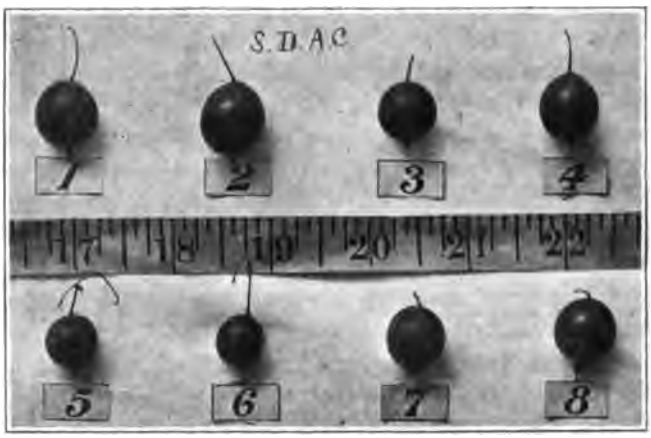
Sand cherry, 8,400; plum, 4,000; grape, 5,000; wild strawberry, crossed with tame, 5,000; strawberry, pure native, 1,000; pin cherry, 25; choke cherry, 360; golden currant, 200; black currant, 2,200; buffalo berry, 180; gooseberry, 425; wild raspberry, crossed with tame, 200; raspberry, pure native, 40. Total, 27,030.



Showing Variation in Sand Cherry Seedlings

The most promising of new types of fruit is the sand cherry (Prunus Besseyi). Some South Dakota plants were already on the station grounds. Over 5,000 more plants, grown at Marcus, Iowa, by M. E. Hinkley, now editor of the "Fruitman," from seed he had gathered in northern Nebraska, at Valentine, near the South Dakota

line, were obtained from him in the spring of 1896 and 1897, and seeds from the best plants as they fruited in 1898 and 1899. Of the over 14,000 seedlings I have raised from these plants, 8,400 have been reserved for fruiting. The plants show the most wonderful variety in size and flavor, as pointed out by Prof. Charles E. Bessey eleven years ago (American Pomological Society Report, 1899, p. 160) after examining the plants in their native habitat. Some of the plants found in this first plantation, most of which was grubbed up this fall, bear fruit of large size, with but little astringency. But little, in fact, remains to make this a choice table fruit, and it certainly makes a good fruit for culinary use.



Showing Variation in Wild Gooseberries (Ribes gracile).

In strawberries the work is being followed along two lines: 1. By crossing with cultivated varieties. 2. By pure selection. The native plants, as gathered together from various parts of the Dakotas and Manitoba, several thousand of which have fruited, show marked diversity in size. All are excellent in quality. About twenty plants were selected the past season and layered in pots for pure plantations next year. In crossing to obtain the 5,000 plants enumerated in the list, a new plan was tried. In the fall of 1899 about 350 native and cultivated plants were taken up and grown in the greenhouse during the winter. The tame sorts included the everbearing sorts from France as well as leading American sorts. As the blossoms appeared, the bi-sexual ones were emasculated, and pollen from other varieties was applied to these and to the pistillate blossoms. The plan in all cases was to have one of the parents wild and the other cultivated. The seeds were sown at once and germinated freely. The pure native seedlings were grown from fruit

picked from small patches scattered through a plantation of cultivated varieties. The object of this work is to originate a strawberry that will be perfectly hardy even without winter mulching. These plants go into winter quarters in good condition and will, I hope, begin to bear next year. The experiment will be repeated on a much larger scale this winter. A new lot of seventeen varieties was received in November, 1900, direct from France. I expect, however, that the best results will come from pure selection and am prepared to fruit 200,000 seedlings or more if necessary within the next three or four years to get the variety wanted, if that is possible. and I believe it is.

Two-year old Wild Gooseberry Plant.

Two-year old Wild Black Currant.

My methods are, in brief, an application of the principle laid down by Darwin that "excess of food causes variation." In fact, I think that variation can be compelled to appear by such methods much sooner than by giving ordinary cultivation. The florist gives high feeding and culture to plants and reaches results much sooner than any other cultivator of plant-life by treating plants as individuals. The first few generations, then, apply the florist methods to any plant that we wish to modify or improve in any way. Break up the plants by the tens and hundreds of thousands, and select from these large numbers for the points desired.

Crossing is resorted to whenever possible, as it hastens the process of evolution by introducing new elements of variation. Realizing, however, that crossing with tender cultivated species in many cases has given a lessened degree of hardiness, the main re-

liance is placed upon pure selection. For crossing, plants are obtained in some cases from drier and colder regions, to give, so to speak, an excess of hardiness. In all cases the plan is to grow as many generations as possible under cultivation in the shortest possible time. My visits to many of the great seed farms of Europe lead me to think that there is much truth in the theory of the cumulative effect of cultivation in causing variation.

Several other native fruits will be given a trial the coming year, and a considerablte quantity of seed has been gathered together from various parts of the northwest.

Of work with cultivated fruits, the apple is made a leading feature. The main effort is to combine the hardiness of the Russian with the long keeping capacity of the American varieties. Many sorts have been grown the past three seasons in boxes and pots, and cellared over winter. The trees are on Paradise stocks. I hope for an "orchard house" as soon as legislative appropriations permit.

The minimum temperature at this station in the memorable winter of 1898-99 was forty degrees below zero, with the ground dry and bare of snow. It is plain that eastern and southern varieties are out of place in this region, and yet native fruits are plentiful. We must take the hint given us by nature and develop a pomology of our own. No work is more worthy of the attention of the station horticulturist in regions where similar extreme climatic conditions obtain. The field is great, and the workers should be many. Patience and perseverance must be the watch words.

Prof. Hansen: When a florist takes hold of a new plant he gives it that exhaustive breeding that will enable him in a year to produce a dozen varieties of it. We can do the same thing with wild fruits by this exhaustive breeding. The way I go at it, the general way, is to start the seeds in flats, and as soon as they are big enough to handle I set the plants in pots. I do not always put them in pots, sometimes I put them in frames and get them as big as possible. They surprised me very much by their size. First sow your seed in flats, then transplant them into frames and carefully tend them the first year and then put them out in the fall. Mine made a very good growth this year. During the dry weather they did not wilt in the least. It is the same with the sand cherry. Sow the seed in flats, transplant into pots and put them right out in the fall where you want them to stay, and you will get four years growth in two, and you will cause that variation to appear. If you get a variation that is satisfactory you can propagate by layering, cutting, grafting and in many other ways.

Mr. J. S. Harris: I would like to ask Prof. Hansen whether by this method of propagating to get a better quality of fruit it is not done at the expense of hardiness.

Prof. Hansen: If you carried the process too far there might be that danger, but I think you can do it to a very large extent and still keep it hardy. There might be such a thing as improving our native plums too much, but you would have to carry it a long way before you would impair the hardiness. For practical purposes I do not think there is any danger of breeding too high in our time. Still, we are experimenting, and we will know more about the matter by and by.

Secretary's Corner.

THE PRESENT ANNUAL MEMBERSHIP ROLL—for 1901 numbers 447 at the date of writing, Jan. 24th, Shall we make it a thousand this year? It depends on you. Have you made an effort yet to help it along? It should not be difficult with all the inducements offered. Take one evening this month and do for another what some one has already done for you.

DELEGATE TO WISCONSIN SOCIETY REPORTS.—President Pendergast, representing this society at the Wisconsin meeting, has made a report of the doings of that society at Oshkosh on that occasion, but it has not been possible to get into this number. Reports of all the meetings in neighboring states are now in except that from South Dakota.

ANNUAL MEETING, SOUTH DAKOTA STATE HORTICULTURAL SOCIETY,—This meeting was held this year on January 22 to 24 at Sioux Falls. Mr. Dewain Cook represented our society. The program for a three day's session contains a large number of interesting topics on subjects of special value to the prairies of that state. Many of the papers written will probably be published in the "Horticulturist" later.

A GOOD MEETING.—Secretary E. W. Randall served up a rich program for the recent meeting of the Minnesota State Agricultural Society, and it was evidently appreciated, for just before adjournment the board of managers were instructed to furnish a stenographic reporter for the next annual gathering and arrange for printing a report of it. That is right. The farmers of the state should have the opportunity to study the wise things that are being said at such meetings as this.

HORTICULTURE IN THE FARMERS' INSTITUTE.—The withdrawal of Mr. A. K. Bush from the institute corps to take his seat in the state legislature divides the work of teaching horticulture at the institutes among a number of the other lecturers, who are qualified to speak on this subject as well as interested to do so. Mr. A. W. Trow, who is a life member of this society, is attending to the distribution of our literature at the meetings, and is assisted on the platform in our special field by Messrs. Terry, Henry, Greely and others. Even Mr. Gregg himself takes a hand occasionally.

THE LATE MEETING APPRECIATED.—A member attending our meeting for the first time speaks in this pleasant way in a recent letter of his enjoyment of the occasion: "I feel it a pleasant duty to express my gratitude to you and the society for the pleasant and inspiring time enjoyed at the annual meeting. It was very elevating for a young man to listen to the addresses and take part in the society's deliberations and notice the spirit which controls and rules the organization and to come in touch with such civil and noble minded people. It made an impression that will stay with me as long as life lasts."

NOTE FROM MANITOBA,—Mr. A. P. Stevenson, of Nelson, Manitoba, who attended our late annual meeting as a delegate of the Winnipeg Society, in a letter under date of Jan. 21, says: "We have had a few severe days since I came back from Minneapolis, 28° below zero being, I think, the lowest, but it was of short duration. It is the long continued severe cold I dread mostly. In this locality the snow fall is very light, barely sufficient for sleighing, although snow is abundant in other parts of the province; but I feel that everything is wintering all right yet. I start out in a few days to address a series of Farmer's Institute meetings on the subjects of fruit growing and tree planting."

THE CRYING SIN.—Mr. Edson Gaylord, of Nora Springs, Ia., has some positive ideas, as may be seen from the following from his pen:

"The crying sin of the horticulturists of this age is the well demonstrated fact that they let go before the readers of so many of our leading farm papers so many most serious and thoroughly proved errors, such as the use of tarred paper to protect trees; to set apple trees to the southwest; to set trees just a little deeper than grown in nursery; to head in on northeast side to make trees grow over to the southwest; to set apple trees down to an angle of 45°; to hedge in orchards closely by hedges, timber or other ways; that any soil that will grow good corn will grow good apples."

A NEW PREMIUM FOR OUR MEMBERS.—Prof. E. S. Goff, well known to our membership as the professor of horticulture in the Wisconsin College of Agriculture, has lately issued a new book entitled, "Principles of Plant Culture." As its name indicates, it tells the story of plant life and in plain terms which do not require a previous technical training in botany, chemistry, etc., to understand. It is an intensely interesting as well as practical book and belongs in the library of the progressive horticulturist alongside of others we have previously recommended. A cloth bound volume of 280 pages, well illustrated and with a full table of contents and index, it will be found very convenient and valuable for reference even after study has made the reader familiar with its contents. This book we offer as a premium for securing two new members for this society, or it will be given for securing one new member and 50 cts. For sale at this office for $1.00.

Extra Early Potatoes.—If it is desirable to have potatoes 7 to 10 days ahead of those produced by ordinary field culture, place uncut tubers, blossom end up, in shallow boxes filled with sand. About ¼ the length of the potato should protrude from the sand. Put the boxes in subdued light in a temperature of 50 or 60 degrees. From 25 to 30 days after the potatoes are thus started take the tubers from the sand and place in a field in the same position they occupied in the box. Potatoes treated in this way will be considerably earlier than if the seed is taken directly from the bin and planted in the ordinary manner.

Edson Gaylord

NORA SPRINGS, IOWA.

[See biography.]

THE MINNESOTA
HORTICULTURIST.

VOL. 29. MARCH, 1901. No. 3.

Biography.

EDSON GAYLORD,

NORA SPRINGS, IA.

Mr. Gaylord's origin is traced, without missing name or date, to Wm. Gaillard, who came to Dorchester, Mass., in 1630, in the ship Mary and John, and whose French Huguenot ancestors had come to England in 1550, to escape persecution. This Wm. Gaillard anglicized his name and became Wm. Gaylord. He was representative to the general assembly for the town of Windsor, Conn., forty successive sessions. One hundred and fifty graves in the cemeteries of Norfolk and Gaylordsville now bear this name. Mr. Gaylord says that "many by this name have undoubtedly deserved the jail, the whipping post and the gallows, but that up to date all have escaped."

His great grandfather, Samuel, took his son, Ager, aged sixteen, to the army at the breaking out of the French and Indian war. Samuel died soon, but Ager served fourteen years, to the close. While skirmishing, he saw two Frenchmen concealed behind trees. He crept behind a stump, and soon a number of shots were exchanged between them. One Frenchman, getting out of powder, stepped to and behind the other. Ager saw his opportunity and quickly sent a ball through both at one shot, and took their valuables into camp. At the close of the war he received for pay, a musket, a knapsack and a roll of worthless money.

His grandson, the subject of this sketch, was born in Northville, Litchfield county, Conn., in 1825. He took his first lessons in horticulture when three years old, from a man employed to graft

his father's orchard. Till about this time, everybody had depended on their home grown seedling apples, the best being saved for eating, and the bad going first to cider, and later to brandy. After following the grafter all day and hearing his wonderful stories of "big red," "large yellow," and "that great white apple," all "so sweet, so mellow, so juicy," is it strange that the boy was seen next morning in the orchard with a dish of clay, a wad of tow and a huge dull butcher knife? Not being able to get at the apple trees, he fell at a clump of quince shrubs but after many efforts left them in disgust and went to a choice young plum tree, for which his father had paid a large price. Here he renewed his efforts, and with vigorous strokes hacked the tree nearly off.

When he was eight years old his father bought a farm in Warren, eight miles north of their former home. His first leisure hours found him gathering stone and walling in a rod of ground, which he soon filled with shrubs and flowers. At thirteen he was hired out to Nelson A. Depew, to work on the farm six months at six dollars per month.

When seventeen, he taught his first school in Sussex county, N. J., commencing his first term with ten pupils and a very limited education. He taught three terms, closing with fifty pupils, two of whom had families.

Returning to Connecticut, he began attendance at the Howards high school. Three weeks later young Gaylord was called on to teach by the director of a rural school which was considered an unusually hard school. Knowing this and his own need of a better education, he at first refused, but after much urging accepted, in case he could secure a certificate, of which he had slight hopes. He appeared before the examining committee, and after a long and tedious examination was ushered into another room, where, after waiting some time, the chairman came and handed him a small fold of paper, which he still keeps, to the no small surprise of his friends. Here he learned that the boys had had a great time with the last teacher, who had left after being admonished by them that they would tar and feather him if he ever darkened their school house door. The fact that this teacher was older and stronger than himself served to increase his anxiety as to what would be the outcome. However, he appeared punctually at his post. Here he found the house full of big rustling boys who seemed to feel that they were the supreme masters of all they surveyed. With grave apprehension he rapped for order, and in a moment all was still. He addressed the motley crowd with a few kind but impressive words, and at once began to seat and classify the pupils. Suffice it to say that he

was employed to teach this same school each successive winter for three years and never saw or had better behaved pupils. His school was increased from adjoining districts till the benches were not sufficient to hold them.

During this time he worked out on farms in the summer and also put in much time improving his old home, blasting huge rocks

MR. GAYLORD IN HIS ORCHARD.

and laying them into heavy stone fences. In this way he enclosed three acres, which he set full of apple, pear, cherry and peach trees. In 1899 he found all gone but the apple trees, these being loaded with the very finest fruit. He obtained his trees from the pastures, woods and by-ways, grafting them the year after set. His cherry

grafts came from the fruit yard of Henry Ward Beecher. In 1899 not a tree had been grafted or a stone moved in the last fifty years, and those old, grim, moss-covered walls, built with his own hands so long before, still stand as everlasting sentinels to protect what still remains of his boyhood's efforts at home making.

After this, he worked a full year for Capt. John Peters, on the farm and in his iron works, making more time working nights here than he lost during the next five years. He next worked two summers for D. C. Whittlesy, who offered to raise his wages two dollars per month if he would stay on.

In 1851 he returned to New Jersey and taught school three terms at Mt. Pleasant, Warren county. Here, aided by his pupils, he walled in two rods of ground, which was divided into small plats, one of which was assigned to each pupil for growing vegetables and flowers. Each received special instruction from his teacher as best how to grow each variety successfully. This is thought to be the first school horticultural garden substantially fenced and kept up for years, in the United States. David R. Warbasse, then one of his students, is now one of the best orchardists in New Jersey, and took fourteen first prizes at their state fair in 1899, for finest apples.

In the spring of '53, the five Gaylord brothers met in serious council, which resulted in the selection of the fourth brother, Edson, to go west and search out homes for the five. April found the young prospector in Kenosha, with cane and satchel. Traveling nearly always on foot and alone, he passed over much of southern Wisconsin, northern Illinois as far south as Quincy, over southern Minnesota, and twice over eastern and northern Iowa. On Oct. 21, 1853, he set his first stakes, and in December completed his pioneer house without nail or sawed board. It was eighteen by twenty-four, mortared inside and out, two stories high, with large stone chimney and fireplace. He selected his land on and adjoining what is now the site of the city of Nora Springs, Ia. There were several hundred acres of this land, mostly very heavy timber.

As an early pioneer, Mr. Gaylord ran many risks and endured great hardships. On the 14th of Nov., '53, he rose at three o'clock in the morning to cut the first log for the first school and meeting-house in northern Iowa, from McGregor west to the Missouri. It was dark as Egypt, and he cut by guess, giving a few blows and feeling to find where they fell. In the spring he burned lime for the school house. Mr. Gaylord burned the only lime and made all the brick (except one small kiln) to supply the country for many years many miles in every direction. He cleared fifty acres of very heavy timber, handling most of this twice over with his own hands.

He gave all his earnings till twenty-one years of age to his parents, and much of them afterwards. He built a house for them near his own, went east and settled their estate, and taking what was left (two hundred and forty-two dollars), moved his invalid parents and two then invalid sisters west and cared for the father, mother and one of the sisters as long as they lived.

Of the nine original members of the family, Mr. Gaylord is the only one now living.

July 21, 1857, Mr. Gaylord was married to Miss Helen M. Lamb of Crystal Lake, Ill. They have one son, Wallace E., and one daughter, Vienna. Mr. Gaylord built the house which he now occupies as a home, in 1866, using one hundred thousand brick and five hundred bushels of lime. The brick, lime, stone, sand and most of the lumber were obtained from the land he had deeded from the government.

He set his first apple trees in the spring of '54, on a "fourth rate" site, and has been setting and re-setting ever since. His experience has taught him that to be successful, trees must have hardy roots, stems and crotches, with the leading branches top-worked. He has now succeeded in fruiting one hundred choice varieties on his fourth rate site, and has one hundred more now coming into bearing. Mr. Gaylord has never set a tree except for home or friends, and never has sold a tree or had any interest in the sale of any nursery stock. He judges the value of all varieties from his own experience of their real worth and from over forty years' observation of other orchards for many miles about him.

Mr. Gaylord claims to be the first man, east or west, to declare in public that the sun, not wind, caused trees to grow northeast (Ia. R. '79, p. 317); and also to publish and denounce the common practice of growing our trees on tender roots (Ia. R. '86, p. 188, "A Blow at the Root"). Also to demonstrate to the public that close protection was ruinous, by exhibiting fourteen varieties from closely protected sites, and fourteen of the same varieties from unprotected sites. These specimens were presented to the Iowa State Horticultural Society meeting at Cedar Falls. Those from protected sites were dark brown, those from unprotected sites clear white. The following fall he examined eight protected orchards, in which the trees had grown three inches and were seriously injured, while those of unprotected orchards had grown twelve, without injury.

As to what he has done in giving us back so many of our old favorite apples, which we had given up so reluctantly, we can here only refer to some few of his latest contributions, viz: Ia. R. '85, p. 166; Minn. R. '86, p. 116; Ia. R. '92, p. 457; Ia. R. '93, p. 322; Ia. R.

'94, p. 182; also to his numerous writings in our horticultural and farm journals, particularly those of the northwest. That the northwest have most highly appreciated Mr. Gaylord's unselfish labors in helping to advance the first and most noble calling given to man is seen from the fact that Minnesota many years ago, and without his knowledge, made him an honorary life member of its society. His own state soon followed suit, as well as the N. E. Iowa Society, in each case by a unanimous vote.

Few men are better known among the horticulturists of the northwest than the subject of this sketch, and none, we believe, are more highly honored for a persistent adherence to what they believe to be the only and the true gospel of fruit growing. He is in every sense a pioneer, hardy and rugged, a true product of the strenuous life the settler of an early day in a new country must live. As such, Mr. Gaylord is entitled to, and is receiving in a gratifying way, a large measure of respect, and his views, which are often radical, the consideration that his experience and unusual powers of observation entitle them to. A forceful man, his life has borne fruit, and its results will run on long after he has ceased his active labors. Such men continue to live, in the largest sense, even after the body is laid away to rest and the name even may have been forgotten.

A. W. L., Sec.

Testing Seeds Cheaply.—One of the most important parts of gardening in winter, when but little outdoor work can be done, is the testing of seeds. Of course those obtained from first-class seed houses, and which are to be sown the year in which they have been purchased, do not require testing, as no dealer who values his reputation would send out seeds about the vitality of which there could be the least doubt. Seeds vary greatly in the length of time for which they retain their vitality. Some kinds cannot be relied upon after one year, while others are safe for ten and more years. It is, therefore, advisable to test all seeds on hand, and thus avoid disappointment and loss of time and crops.

There are several styles of "seed testers" in market, but in a small way any one can test the vitality of left-over seeds, without expense. Pieces of flannel or any kind of woolen material are cut to the size of saucers or plates. Two or three thicknesses are placed in the plate, and 50 or 100 seeds scattered over the surface. They are then covered with more pieces of flannel and thoroughly moistened with lukewarm water. The saucers are then to be put in a warm place. The flannel should never be permitted to become dry. By examining the seeds from day to day and removing the sprouting ones, the percentage of good seeds is easily ascertained.

MY ANNUAL FLOWERS.

WM. TOMLISON, HUTCHINSON.

It is supposed that every lover of flowers at some time chooses his favorite. So when a boy, we chose our favorite from the beauties in the terraced gardens at Riverside, in the suburbs of Cincinnati. That choice stayed with us until we made our first excursions into Minnesota, some twenty years ago, and from the profusion of potted plants in every house and wild flowers by the acre, we decided to make another choice, as our favorite was not seen in its perfection in this clime. But from the continuous new arrivals, and the old changing to greater size and beauty, we are undecided yet.

About four years ago my wife asked to have a separate lot for flowers. On looking around we found an out-of-the-way corner, too small and irregular for pumpkins or potatoes. So I says, "There! I will sacrifice that lot, though it is good, rich ground." It was soon made so attractive that a lady from town saw and walked fast for the garden, exclaiming: "But how do you keep the chickens out?" And her companion says: "Don't you see the fence?" just in time to save her from the rebound.

I came, I saw and I heard the program of your meeting last winter for the first time. I received a new inspiration. For on arriving home, I made out a list of 160 apple trees, and then talked flowers. For who could do otherwise after hearing the papers on floriculture, with its pleasures and profits, by the ladies of this society?

We had torn down the barns to build greater and more distant from the house. This rich lot left we decided to give for a better flower garden. My better half said it was worth my while to make another trip to the horticultural meeting.

Now for the expected profit, which is "pleasure." We prepared this lot according to directions, removing the hardy plants and shrubs to the background, and then prepared to take lessons while the seed and bulb planting was done by those who knew better how.

On April 10th, from a bed of wild plants a little flower appeared. And now was early rising with the children to greet and count the new beauties, as they began to appear from every corner. A report was given at the breakfast table on the number, size, shape, color and beauty of the new arrivals. The last discovery was made Dec. 1st, '99. The pansies were again in bloom. They found December 1st as pleasant as May.

The path to my work led by this garden of our summer's joy, and from its ever present trainers I learned the habits and requirements of many plants.

The balsam is one of the most beautiful and easiest grown of all annuals. For early, sow the seed under glass; or sow in the prepared bed about May 10th. Have plants 18 inches apart each way. They are gross feeders, and a very rich soil is not necessary.

The petunia is a flower for everybody. It is best to start seed in the house, and plant in bed twelve inches apart. It seems to defy heat and drouth, and rain won't hurt it.

Phlox. The new ones of recent introduction surpass almost everything else in dazzling brilliancy. Plant a distinct kind, in rows close together, and you will have a beautiful ribbon bed.

Portulaca. This flower don't ask any favor. It will grow without it. Plant the several varieties in a half circle, and they will outrival the rainbow in colors..

Pansies. What is more beautiful and a more universal favorite with young and old than a bed of pansies! Friends call them heart's-ease. They ask this favor: to be in the sunshine till noon, and the shadows to cover them in the afternoon. To prepare a bed, dig out the old soil, then get a supply of leaf mold, and mix with it one-fifth of well rotted manure and one-eighth ashes or soot. Fill the bed a little above the level. Set plants a foot apart each way.

Seed sown in the house in April should bloom in June. If sown in August and plants lightly covered through winter, they will bloom early in the spring.

Asters. The queen of autumn annuals and indispensable for the flower garden. Among the best for show at fairs and exhibitions. Flower of the most perfect form, being loose, like the poppy, imbricated as the rose or incurved like the chrysanthemum. The plants are tall, half dwarf and dwarfs.

The dwarfs are like so many bouquets and are particularly fine for borders; half dwarfs are most excellent for pot plants; the tall for background and cut flowers. To prolong the season make several sowings. These plants need water and mulching.

Nasturtiums take a high stand among the annuals. They are so easily grown, with attractive foliage and beautiful blossoms, borne profusely all summer long. Insects have no use for them. They stand drouth well and need but little care. Plant on thin soil and don't let seeds form.

The nicotiana. A sweet scented, even bloomer. Is one of the best annuals to pot for winter, as it blooms profusely for months.

Irregular planting about the grounds, leaving a broad, open lawn where possible, will add much to the beautifying of the place.

A hardy vine may also be used here and there to cover an unsightly trunk of a tree or other object. It may also be trained to cover a portion of the house or porch with its graceful foliage. Herbaceous plants, perennial and annual flowers can also be worked in among the shrubbery and give to it a finishing touch by the surprise it affords.

Tastes will differ much in the arrangement and extent to which some varieties are used, but on the whole there must be a basis to work on. It takes much thoughtful planning on the part of the planter to obtain desired results, and it is far better to go slow but sure. Thereby much greater success is likely to attend your efforts, and you will always have occasion to look upon the work accomplished as "A thing of beauty and a joy forever."

Give the Boys a Garden Plot.—My younger brothers, aged 7 and 9 years, who took a great interest in the garden last year, will be able to help me more this year. It was impossible to keep the time they worked, and I could only get at it by paying a small wage for doing certain things, and debiting it to garden. This pleased them and gave them quite an interest in it, and both wish small gardens of their own this year, which they are to get, and both have their plans already, as to what they are to grow in them. I expect the garden contest will bring many more young and old to take more interest in the garden, and among none is it more needed than among farmers, whose gardens very often in the fall are only noticeable by the weeds being particularly strong.—G. P.

Vice-Presidents' Reports, 1900.

VICE-PRESIDENT'S REPORT, FIRST CONGRESSIONAL DISTRICT.

F. W. KIMBALL, AUSTIN.

I have been out of the part of the country of which I am supposed to report a good share of the season, and have to report largely from general reports I get. The blossom in the spring was full and covered the entire country. As a rule, the berries suffered from one-third to one-half loss of crop, owing largely to the drought, and the crop was a good deal dependent on the cultivation it got or the amount of mulch. With me the strawberries were good, while the raspberries were almost a total failure—as well as the gooseberries. Apples were good all over the district, yet quite a large loss is reported from premature falling, owing probably to the drought of the early season. The trees have gone into winter quarters with a good deal of unripened wood, and a hard winter or even a short season of extreme cold is liable to cause a good deal of damage. I think the ground is so saturated with water that there can be no reason to fear root-killing, and hope that my fears for the tops may prove groundless.

VICE-PRESIDENT'S REPORT, SECOND CONG. DIST.

S. D. RICHARDSON, WINNEBAGO CITY.

The fruit crop of all kinds was very satisfactory this year, especially of apples and plums, although they began to drop early and dropped all through the season.

Plums rotted a little in some localities, in others not at all.

Apples were so abundant that Duchess and crabs were practically worthless and rotted on the ground in some parts of the dis-

trict; in others they brought a good price. Wealthy and good shipping varieties could be sold even where apples were most plentiful.

The drouth affected strawberries some, but in most localities where they were well mulched and on moist ground the crop was good.

Raspberries winter-killed in some places where not covered, but where they were covered bore an immense crop.

Blackberries were good.

Sand cherries bore well with Dewain Cook, but here they have not amounted to very much for several years. Mr. Cook also reports a good crop of dewberries. The birds always capture all the dewberries and sand cherries at Winnebago City unless they are picked before they are ripe. We have a grove of Russian mulberries and depend on them to feed the birds, and we can raise cherries, of which the crop was fair this year, but the sand cherry comes later.

Grapes were a light crop generally, but we have some Concords running wild over the trees which fruited much better than usual.

Have heard reports of Wyant, Wood, Mankato and New Ulm rotting in some localities, while in others they were among the most satisfactory varieties raised. We have Cheney plums planted in two places, a few rods apart, and some years have had the fruit in one place entirely spoiled by the plum pocket, and in the other place perfectly free.

The trees seem to be in good condition for winter, although apples and cherries are holding their leaves like white oaks.

FRUIT LIST FOR SECOND CONG. DIST.

Best apple, thoroughly tested in all parts of the district, for market and home use: Wealthy. Earliest apple and crab: Tetofsky, Early Strawberry crab. Summer, fall and early winter apples; Duchess, Charlamoff, Hibernal, Longfield, Patten's Greening, Kaump, Wolf River.

Long-keeping winter apples, not very hardy but doing well in many localities: Malinda, Talmon Sweet.

For trial: Summer, fall and early winter apples that are bearing and doing well in some places in the district, or not far away, under conditions similar to those in the district: Okabena, Yellow Sweet, Breskovka, Nos. 2 and 6 Oligher, Peerless, Superb, Plumb's Cider.

For trial, winter apples that are bearing in some places: Hotchkiss, Mary, No. 2 Crampton, Repka Malenka.

Crabs for general cultivation: Virginia, Martha, Whitney, Minnesota, Sweet Russett, Lyman's Prolific, Florence.

Cherries: Early Richmond, Ostheim, Wragg, Russian.

Plums: De Soto, Forest Garden, Rollingstone, Wyant, Hawkeye, Stoddard.

For trial: Aitkin, Surprise, Mankato.

Grapes: Concord, Worden, Agawam, Janesville.

Red Raspberries: Loudon, Turner, Brandywine.

Black and Purple Raspberries: Palmer, Nemaha, Older, Gregg, Ohio, Columbian.

Blackberries: Ancient Briton, Snyder.
Currants: Red Dutch, White Grape, Victoria, Stewart, Long Bunch Holland, North Star.
Gooseberries: Houghton, Downing.
Strawberries: Pistillate—Crescent, Warfield, Princess, Haverland. Stammate—Bederwood, Splendid, Brandywine, Clyde.
Native fruits valuable in certain localities: Dwarf Juneberry, Sand Cherry.

VICE-PRESIDENT'S REPORT, THIRD CONG. DIST.

MRS. A. A. KENNEDY, HUTCHINSON.

The crop of crab apples was immense. I never saw trees so heavily laden. In my garden I have Okabena, Hibernal, Borovinka, Stoddard, Wealthy, Patten's Greening, Peerless, Duchess, Sweet Russet and Tonka crab. They were all set four years ago, except the Peerless, which I got eight years ago. I transplanted them once on the farm, and when we moved to Hutchinson took them up again. They bore last year for the first time, and one tree had seven apples. This year two of the seven trees bore a few, but the wind blew them nearly all off. They are making a good growth—bark smooth and show no signs of blight. My Okabena bore this year; the tree. hanging full of fruit, was a lovely sight to behold. Wealthy is the only one that has blighted. These trees are growing on a southern slope, look well, healthy and are making a splendid growth in spite of predictions to the contrary. Plum trees on the same slope are looking fine. We set three Surprise plum trees this last spring. All lived and made an exceedingly good growth, while Mr. Taylor lost nearly all of his on account of the drouth. The water from a flowing well carried ours through all right.

Mr. W. W. Pendergast has 450 apple trees in orchard, forty-nine in bearing. Early Strawberry, Volga Cross, Whitney No. 20, Red Anis and Wealthy blighted a little. Two Bessemianka pears are standing side by side: one blighted, the other did not. They were set seven years next spring. The kinds of apples he considers the healthiest and strongest growers are as follows: Hibernal, North Star, Volga Cross, Duchess, Wealthy, Okabena, Peerless, Charlamoff. Out of twenty-five hybrids, he designates these three as the very best: Whitney, No. 20, Sweet Russet, Early Strawberry; the latter very good for just two days.

Plums, 100 in number; twenty-five kinds. He would put Cheney at the head of the list, though on his soil it pockets; Rolling-stone, 2nd; Wolf, 3rd; Aitkin, 4th; Cottrell, 5th; Odegaard, 6th; Wyant, 7th; Hawkeye, 8th; Wood, 9th, early and large; Ocheeda, 10th, good; Comfort, 11th; Slender, slow grower, bushy, highly flavored, hardy.

Strawberries in our district winter-killed. In our garden, where we mulched with leaves, they came through all right. We have had the best success with Crescent and Bederwood. The early plums bore a good crop; later ones were cut off by frost.

VICE-PRESIDENT'S REPORT, SIXTH CONG. DIST.

MRS. JENNIE STAGER, SAUK RAPIDS.

A great quantity of fruit plants were bought and planted this spring throughout this section of country; subsequently a good part of it was lost, owing to the long continued drought. Quite a large quantity of apples were harvested, but most small fruits did poorly. Wherever fruit was mulched well, a good crop was harvested, but that was the exception. Of course, more fruit trees and shrubs will be planted to replace those lost, as the omnipresent

Flower garden and grounds at Mrs. Jennie Stager's residence.

fruit agent will always give us the chance. Cultivated plums, although not bearing much this year, have lived and thrived, and there is hardly a farm but has plum trees living and doing well. Raspberries (Cuthbert and the old Philadelphia) I find in every part of the country, as well as the Red Dutch currant, and in many places finer but not more prolific kinds are found. In a way, we are getting to be quite a fruit country up here. If only that thousand dollar prize apple tree was in evidence.

VICE-PRESIDENT'S REPORT, SEVENTH CONG. DIST.

D. T. WHEATON, MORRIS.

The climatic conditions during the past year have been characterized by extremes of temperature, severe and protracted drought and excessive moisture at times. The conditions have made the season a trying one for fruit growing. The fall of snow over a large part of this district was very light, and the temperature was low, so that the winter was something of a test one; but tree, bush and vine that had received proper care, with few exceptions, came out of winter quarters in good condition. Apple, plum and plant blossomed full and promised an abundant harvest, but the long continued dry weather very materially shortened the crops, and especially of small fruits.

Strawberries started well and up to near ripening time were never more promising, but owing to lack of moisture the crop was very short. It was much the same with raspberries. Currants and gooseberries were a fair crop. Few grapes.

Crap apples were plentiful, and the apple crop was abundant for northern Minnesota.

Many trees, scattered over the northwest, that have survived the rough usage of man and beast, produced a good crop of fine apples and proved to a gainsaying and doubting people that apples can be grown in northern Minnesota.

Of apples, the Duchess, Hibernal, Whitney and Minnesota stand at the head, but the Wealthy, Patten's Greening, Peerless, Longfield and others are promising finely.

The plum crop, both wild and cultivated, was never better.

The season for plant growth was so dry that little growth was made till August, when heavy rains came. The July rain was not enough to do much good. A large growth was made during August and September, and it is questionable how well ripened the wood is to stand the winter.

There was but very little fire blight, owing largely, without doubt, to the prevailing dry season. Too much or too little moisture often is the cause of failure in fruit growing.

Horticultural interests are looking up and to the State Horticultural Society for help.

FRUIT LIST.

Apples: Duchess, Hibernal, Patten's Greening, Wealthy, Longfield, Peerless.

Crabs and Hybrids: Minnesota, Whitney, Early Strawberry, Tonka, Powers, Pride of Minneapolis, Faribault.

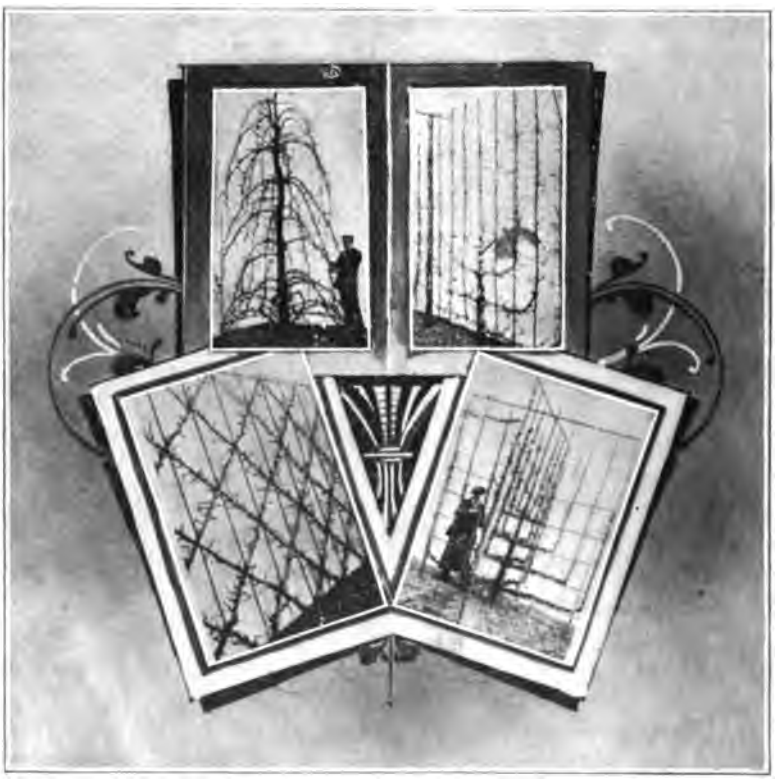
Plums: De Soto, Wolf, Forest Garden, Rollingstone, Aitkin, Wyant, Cherry, Surprise.

Grapes: Concord, Worden, Janesville, Delaware.
Raspberries: Red—Turner, Loudon, Purple—Schaffer.
Black Caps: Kansas, Older.
Blackberries: Ancient Briton.
Currants: Red Dutch, Stewart, White Grape.
Gooseberries: Houghton.
Strawberries: Crescent, Haverland, Warfield, Capt. Jack, Bederwood, Lovett, Enhance.

EUROPEAN NURSERIES.

PROF. SAMUEL B. GREEN, ST. ANTHONY PARK.

There are many scenes in European nurseries which strike the American nurseryman as peculiar. Among these there is perhaps no way in which they differ so much from us as in the use of hand labor, which in European nurseries almost entirely takes the place of horse



Curious forms of pruning apples, pears and peaches seen at the National School of Horticulture, at Versailles, France.

labor. This is undoubtedly due to the fact that hand labor is so very cheap there. It is a common sight, too, to see women at work hoeing and in the general work of keeping down weeds. The great demand for trees trained in espalier and fan-shaped forms necessi-

tates the growing of these in the nurseries, and they are generally trained flat against several, perhaps six, stakes to each tree. Thus, an apple tree, instead of growing as with us, is very likely trained in fan-shaped form, extending across from one row nearly to the other. Such plants must be handled with great care and occupy so much of the land that it is out of the question to get in amongst them with a horse.

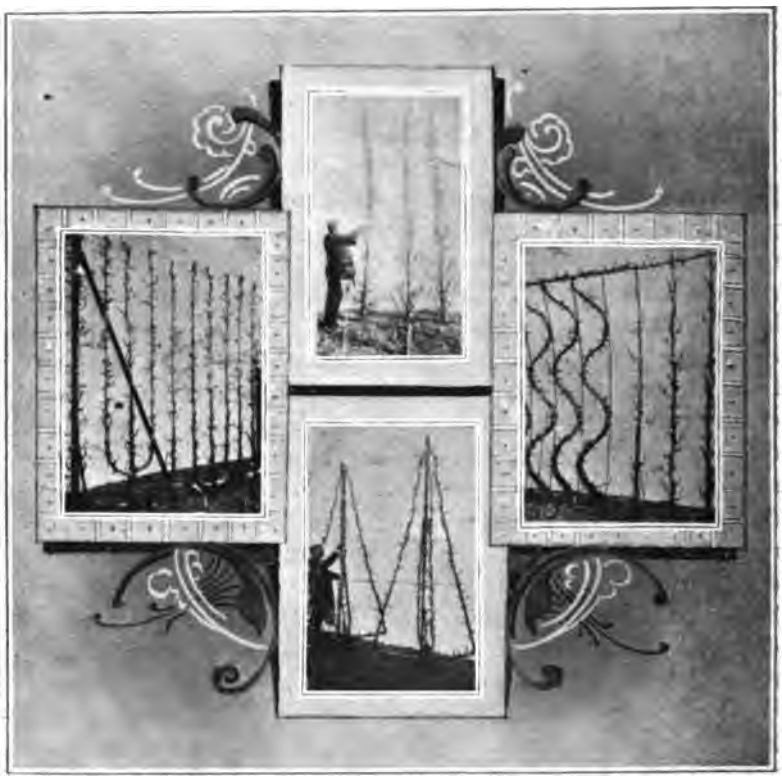
The growing of gooseberries in tree form is also an object of interest, and in this section the gooseberry is a very important fruit and is eaten in a raw state in large quantities. Occasionally one will see both the currant and gooseberry on the same stock, and each worked about three feet from the ground.

In response to a demand for trees for setting out during the growing season, the larger nurserymen grow apple, pear and other trees in pots, tubs or willow baskets, in which they may be moved at any season of the year. This is a feature that in some sections of this country might perhaps be adopted to some advantage, at least in a small way. It frequently happens that in some of the retail nurseries in this country, where a good retail business is done in high priced ornamentals, a customer comes around just after the sale season is past, or even late in June, and is willing to pay a good price if he can have his planting work done that season. It is under such conditions that it might be well here to grow some plants in pots or tubs. I noted that it was a common practice to grow evergreens in beds, even after they were, perhaps, a foot or more high. I inquired the reason for this and asked why it would not be just as well to plant in long rows and to cultivate with some hand cultivator, and was informed that it would not do to walk between the rows of seedlings, as it would interfere with their growth, and at the same time I was given a sort of look as though I was not quite on to such matters and had simply displayed my ignorance.

Among the few cases in which I saw a four-footed animal assisting in nursery work was where a small burro was used for drawing a spraying apparatus through the rows in a nursery near Berlin. This spraying apparatus, by the way, was of much interest to me from the fact that the power for forcing the spray came from carbonic acid, which was generated in the receiver by the use of acid and marble dust in the machine itself. It was too heavy and clumsy, however, to be practical; but it may possibly indicate the direction in which improvements should work in this country. It is certainly a novel idea.

It seemed to me that the nurserymen and seedsmen in Europe lay special stress on getting some land that lies along a railway track,

and then making it beautiful with a succession of flowering and foliage plants. Near by, of course, they will have a large but neat sign indicating whose establishment it is. This form of advertising seemed to be a special feature among English nurserymen, and a very pleasant feature it is. There is a dignity and high standard and truthfulness about such advertising which no printing will take the



Curious forms of pruning apples, pears and peaches seen at the National School of Horticulture, at Versailles, France.

place of. When such places are by the side of some suburban line that is patronized by hundreds of thousands of people daily, many of whom come to note the frequent changes in landscape effects produced during the season, I am inclined to think it a very desirable form of advertising.

The melon caterpillar can usually be destroyed by spraying with Paris green while the larvæ are feeding upon the foliage or upon the outside of the stems.

SUPPLEMENTARY PLANTINGS IN THE ORCHARD AND THEIR ROTATION.

O. M. LORD, MINNESOTA CITY.

The conditions of orcharding in Minnesota are quite different from those farther east and south. There may be little difference in the elements of the natural soil, but the climatic conditions of life and growth are quite dissimilar. Here, with a newly planted orchard, a partial shading of the ground or some mechanical method of keeping the soil moist and cool during July and August is an absolute necessity. Taking into consideration the price of land and labor, for a large commercial orchard thorough shallow cultivation will probably be found to be the cheapest and most reliable method to secure these conditions. For the smaller orchards, for home use, where cheap hand labor is available, very good results may be obtained by supplementary plantings while the trees are young.

It is assumed that the soil has been thoroughly subdued by cultivated crops before planting the trees, and if old ground is used an application of manure may be necessary, at least a system of fine tillage should be secured for best results with trees and with the supplementary crops. For first planting squashes are an excellent crop. They take little or nothing from the fertility adapted to the trees, shade the ground completely and keep the surface in fine condition to conserve the moisture during the heated term.

If the soil is of such a nature or texture that more working is required, a crop of potatoes or of beans may be grown. If the orchard ground has been highly manured or if it is nearly new, strawberries may be profitably grown between the rows, leaving ample room next to the trees for cultivation. Very good results may be had with red raspberries, with no detriment to the trees and an advantage of partial shade for the berries. If the trees are far enough apart, a row or two of blackberries may be grown very profitably; though as the trees begin to bear fruit, these are more in the way than raspberries or strawberries. Rows of currant bushes serve a mutually beneficial service.

For the small or home orchard any or all of these supplementary plantings are entirely practicable and desirable. If they interfere with the trees, they are easily removed, and clover may be substituted, especially as the trees come into bearing; but clover should not be removed from the ground. It should remain as a mulch. Under no conditions should timothy, wheat nor oats be sown in the young orchard. Buckwheat is sometimes advantageous, especially if the ground has become weedy or infested with quack or with fine grass.

Mr. Oliver Gibbs: I have had a little experience in planting squashes among apple trees. I find they will climb the trees and hang all over them, and they give them the same kind of protection the anaconda gives the deer. Thev hang their fruit on the tree—and how can a young apple tree stand it with a twenty pound squash hanging to it? The shade is very nice, but deliver me from anything that will climb the tree. I have had watermelons hanging on the side of a chicken fence three or four feet from the ground, and they hung there long enough to demonstrate the fact that when they get too heavy they drop off. If Mr. Lord will tell us some way of having those squash vines among the trees without having the squashes get into the trees I will take back all I said.

Mr. E. R. Pond: I can tell him how he can prevent that; just pass along occasionally and cut off the vines before they grow up into the tree.

Mr. O. M. Lord: I have found it necessary for the protection of my orchard and fruit to give it some care. If I wanted the vines to grow into the tree I would have said so; they should be planted in such a manner that they could not climb the trees.

Mr. J. S. Harris: I have a few apple trees, and the most profitable crop I ever raised on them were apples and pumpkins. I have been able to raise a few apples for the state fair, and I have also been able to get some very fine Hubbard squash.

Mr. C. W. Spickerman: Almost any kind of vegetables planted among young trees would be proper, but when you come to raspberries, blackberries and currants I do not think they ought to be planted among apple trees because they are wood producing plants and draw from the earth the sustenance that should properly go to the apple tree. I think the trees are injured. I planted some trees in a black cap patch, and I had to remove them. I found it very injurious. Those set in the black cap patch did not make as much growth in three years as those in the truck patch did in one year.

Mr. S. D. Richardson: The old saying is that "The proof of the pudding is in the eating." I have seen raspberries, blackberries and currants planted among the orchard trees with the best results. In our section of the state experience has taught those who have been growing fruit the longest to shade the ground. It is not the natural condition for a tree to stand in the hot sun. An orchard left clean all the way through to November in the hot sun will be injured. I can show you orchards under cultivation grown up with weeds where they have grown lots of apples and have sold them and turned them into money. If you can set your orchard to small fruit and give the ground shade, you will find it the greatest benefit. Wherever I have seen it tried it has been a grand success.

Mr. R. H. L. Jewett: Perhaps our experience is more in the way of raising apple trees between the raspberry rows, and our orchard is set out in raspberries, strawberries and gooseberries. The berries did not get enough fertilizer to carry them all together. We put on this year about two hundred loads of good strong fertilizer, and we see them doing nicely. I want to say something about grow-

ing things between raspberries and strawberries, and more particularly raspberries and blackberries. I thought the ground should be covered with something; I thought it ought to be shaded with something adapted to it so it would not injure the crop. I put in potatoes, turnips, onions and peas and, finally, beans. Our experience with the peas was not very satisfactory, but the beans we have planted three years. We have got a variety of bean that will drop its leaf before we pull them.

PLUM ORCHARDING.

MARTIN PENNING, SLEEPY EYE.

Wild plums thrive best where the soil rests in a state of nature. They propagate, or perpetuate, themselves by two methods, viz.: (1) by seeds falling in the ground and (2) by sprouts from the roots of the trees. A slight covering of the seeds with soil or leaf mold in the fall causes the seeds to grow in the spring. The seeds usually send down a tap root through the surface soil, and if the moisture is sufficient for life the root makes a right angle and searches for food in the leaf mold or surface soil. If moisture is lacking the tap root goes straight down and sends out lateral branches in search of food. Where the seeds are sown for cultivation in a finely prepared soil the roots usually go straight down, as the ground is not shaded and the natural conditions of moisture are not present. There are two ways of securing this necessary moisture for the growing trees and the production of fruit: by mulching and by thorough culture, or working, of the soil.

The mulching, though apparently conforming to nature's method, has a tendency to produce roots nearer the surface, and the trees are more liable to suffer from drought than when the soil is properly worked and kept finely pulverized.

Though nearly all of our soil has all the elements of fertility needed in plum culture, the trees will bountifully respond to generous manuring if the land has been devoted to grain or grass previous to planting. Almost any of the new lands are adapted to plums.

In cultivating the plum orchard where manure is applied, more or less weeds and grass will appear. The trees should be set so as to facilitate plowing and working both ways. Shallow cultivation is much the best, as deep plowing has a tendency to break the roots and thereby produce much sprouting and injury to fruiting. If weeds or grass are taken in time, very little plowing will be necessary. In any case the culture should only be deep enough to insure good work.

On old ground an application of ashes will be found beneficial, especially to young trees, and it is believed that it has a marked influence in perfecting the fruit. On new land the element of potash is generally abundant, as the vegetation has been annually burned for many years.

In discussing the treatment of the soil for successful plum orcharding, no iron clad rule can be laid down, but we know alluvial soil to be adapted to their natural growth, indicating a rich soil, not only in its chemical composition but in its surface covered with leaf mold or other decayed vegetation. If the orchard must be placed on poor or worn out soil, the land should be enriched, and if

Residence of Martin Penning, Sleepy Eye, Minn.

upon a heavy clay soil should be deeply plowed and brought into fine tilth by thorough working. In short, any system may be followed necessary to produce a good crop of grain or roots.

When the trees have reached maturity, if a good root system has become established, the orchard may be seeded to clover with no detriment to its fruiting. For the small orchard for farm use, when first set with trees the ground may be planted with potatoes or squash, which will shade the ground to advantage, but on no account will it be found profitable to sow grain.

On a sandy or light soil fall plowing is not desirable, but a heavy clay will be benefited if plowing is done in the fall. If summer cultivation is not practicable, a heavy mulching with manure or coarse litter, put on from the first to the middle of June, will in a measure assist the trees to maintain their vigor in season of drought.

ANNUAL MEETING OF THE WISCONSIN STATE HORTICULTURAL SOCIETY, 1901.

W. W. PENDERGAST, DELEGATE.

Hutchinson, Minn., Jan. 21, 1901.

Having been appointed a delegate to represent our society and exchange greetings with that of our sister state at the Oshkosh meeting, held the first four days of last week (Jan. 14-17), it now becomes my pleasing duty to give a brief report of the work in which I found the society engaged and how they propose to carry it on. If we can learn anything from them that will help us in our efforts to do better work, that will be of special interest.

The sessions began Monday evening, in order to close a day earlier, thus giving members from a distance two days during which they could visit neighboring orchards and nurseries—of which there are many in the vicinity of Winnebago Lake—and get some object lessons to illustrate the various papers and addresses made at the meeting, thus fixing the methods recommended more firmly in their minds, to be used as subjects of thought and experiment till the next meeting offers another opportunity for a general consultation and clearing up of the points not thoroughly understood or for further discussion of those whose correctness they feel like challenging.

The number of different subjects treated was very small in comparison with ours. For instance, instead of assigning the propagation of raspberries to one man, cultivation to another, fertilization to still another, pruning to a fourth, winter protection to a fifth, the best kinds to grow for the market to the sixth, will it pay to irrigate to the seventh? etc., they would give the entire subject of small fruits to one or two members and use the time so gained in discussion. The discussions were very valuable, but I doubt if so many members are called out to the meetings as would be the case if sixty or seventy had parts assigned them a couple of months beforehand, and it was understood by all that no failures to respond at the proper time would be looked upon with the least degree of allowance, unless a good reason could be given. Both plans have their advantages, but it is almost always true that the better the attendance and the more widely the work is distributed, the more profitable the meeting.

The talks given and the papers read were of a very high order, full of enthusiasm and earnestness and also full of meat. When it came to the discussions there was no lack of bright and experienced men to do their full duty by throwing additional light upon the various subjects and pointing out mistakes and showing wherein their individual experiences had led them to different conclusions.

While, as a rule, the horticulturists of Wisconsin seemed to be fighting the same enemies with which we have to contend—blight, summer scald, root-killing, apple curculio, plum curculio, coddling moth, plum-pocket, winter-killing, etc., it was nevertheless apparent that fruits which we watch with considerable anxiety during hard winters are considered quite hardy in all that part of the state south of the parallel of Oshkosh. Those who spoke of the Wealthy, Duchess and Hibernal put them all in the same list, and the Wealthy was generally spoken of as perfectly hardy. In answer to my question as to which was the hardier, Wealthy or Duchess, there were two answers, both in favor of the Wealthy. The others probably classed them together as sufficiently hardy for their climate.

Among the apples exhibited I saw no Okabenas, Peerless, Peters, Patten's Greenings, 102's, Gilberts. Bretts or Repkas, though, possibly, some of them may have been there.

The display was not as large or as varied as ours. That, doubtless, indicated the repose of conscious strength. Michigan, it is said, had a decidedly smaller show.

It was refreshing to see a good exhibit of garden vegetables, all of which were of the right size for culinary purposes; no overgrown monstrosities, no imperfect specimens. I think we should do well to imitate our sister state by calling for a general assortment of vegetables and offering small premiums for the best of the kind described.

Although no official lists of fruits were adopted by the society, several experienced fruit growers were asked to give the society the benefit of their judgment.

Mr. Henry Tarrant, of Janesville, gave his choice in the order of their seasons as follows: For southern Wisconsin: Duchess, McMahon, Wealthy, Northwestern Greening, Flushing Spitzenberg.

Dr. T. E. Loope, of Eureka, selected for central Wisconsin: Duchess, Wealthy, Northwestern Greening, Fameuse, Perry Russet.

A. D. Appletree Barnes, of Waupaca, named for northern Wisconsin: Duchess, Wealthy, Northwestern Greening, Talman Sweet, Walbridge.

Prof. E. S. Goff, of the State Experiment Station, recommended as worthy of trial the following new plums selected from a large number with which he was experimenting: Brittlewood, Bomberger, Etta, Freeman. They give promise of proving very valuable.

Of the older varieties the following were spoken of by Prof. Goff and others as the best: De Soto, Hammer, Aitkin, Piper, Surprise, Springer, Wyant—Surprise, Springer and Wyant being the "creme de la creme."

It was recommended to spray plums with Bordeaux mixture three weeks before buds swell and again soon after blooming. For chewing insects, add one ounce of arsenic to forty gallons of water. For sucking insects also spray with kerosene emulsion.

Instead of Bordeaux mixture some recommended a liquid made as follows: one lb. arsenic, two lbs. fresh lime, two gallons of water; boil forty minutes. When used, add 300 gallons of water.

The best three varieties recommended by Geo. J. Kellogg were: Bederwood (S), Warfield (P), and Senator Dunlap (S). Others highly spoken of were: Johnsons (S), Excelsior (S), Haverland (P), Sleeper (P), Tennessee (S), Kansas (S).

Hon. Charles Hirschinger felt safe in recommending the following cherries and no others: Early Richmond, Late Kentish, English Morello, Ostheim, Montmorency, Wragg and Jefferson.

Not enough was said about other fruits to warrant my undertaking to say what the favorites were, as no official list was adopted.

I must not, however, forget to mention that the Wealthy was considered the most nearly perfect apple they had.

The fact that the number of young members was small in comparison with ours was very apparent, but the middle aged men were decidedly in earnest, and much is to be expected of them in the near future.

There seemed to be a very "close communion" between their society and ours. Their sympathy with us and our work is most cordial, and they are anxious to have the two societies mutually helpful.

The following resolution was unanimously and enthusiastically adopted:

Resolved, that the executive committee of this society be authorized and instructed to co-operate with corresponding committees of the Minnesota, Iowa, North Dakota and South Dakota societies in advancing the cause of horticulture, each state following a certain line allotted it; and, also, in devising the best plan for a memorial to the late Peter M. Gideon to commemorate his grand work in the interest of apple growing in the northwest.

The foregoing is the substance but not the exact language of the resolution, since I am obliged to reproduce it from memory.

The meeting was an interesting and most valuable one. It will be long remembered with pleasure by your delegate.

ANNUAL MEETING, 1901, SOUTH DAKOTA STATE HORTICULTURAL SOCIETY.

DEWAIN COOK, WINDOM, DELEGATE.

Leaving Windom at noon, on Jan. 21st, I stopped over at Worthington, Minn., for about three hours and visited the Ludlow orchard, on the south shore of Okabena Lake. This orchard is about twenty-five years old, and the home of the original Okabena apple tree. I believe it is one of the finest, if not the best, old orchard in western Minnesota. The old Wealthy trees are in apparently just as good condition as were the old Duchess, and both were about perfect. The original Okabena tree is in fair condition. It has quite a bit of sunscald upon it, but looks as if it was good for quite a few crops yet. This orchard was in a mat of blue grass, and it has not been cultivated for the past eighteen years, but has during that time been heavily mulched five times with stable manure. This method has certainly been a success with the old orchard, but his young orchard given something like the same treatment has not been much of a success and indicates to me that cultivation is preferable to blue grass or mulching for young trees.

Again taking the train, I arrived at Sioux Falls a little after dark. On the morning of the 22d, we proceeded to Germania Hall, where about twenty persons were assembled. Mr. H. C. Warner, the president, not being present, Mr. Geo. Whiting, of Yankton, took the chair (and held it throughout the three day session). Prof. N. E. Hansen was secretary.

Your delegate was made an honorary member for one year, and called upon for a few remarks. Prof. Hansen then gave a short talk on the root-killing of our otherwise hardy apple trees. This was followed by a talk by President Whiting. These talks, with the discussion that followed, brought out the fact that winter root-killing of newly set apple orchards is altogether of too frequent occurrence.

Prof. Hansen stated that the plum worked on the sand cherry and allowed to grow in bush form was quite ornamental, and recommended it for the amateur and for the home garden. He also thought that the buffalo berry could in time be increased by selection, cultivation, etc., to ten times its present size.

We convened in the afternoon with about fifty persons present. Mr. Whiting reported that 8,000 bushels of apples were grown in the Alderman orchard the past season. Joseph Andrews, of Hurley, in a paper on "Mulching vs. Cultivation," stated that cultivation was best where it would be practical, but mulching should be resorted to by farmers, as they are not likely to cultivate as it should be done. Prof. Hansen cautioned against putting a heavy mulch around trees when the ground was deeply frozen, as he had known of trees being killed thereby, the trees putting forth their foliage in their usual season, while the roots being encased in ice could not supply the needed sap, and that which was in the trees became soon exhausted, and the trees died. He also thinks that cultivation should usually follow mulching, but that some fruits, like the currant and the gooseberry, will stand heavy mulching year after year.

Reports showed that the plum crop was destroyed by spring frost in the Missouri valley, but otherwise a fair crop of fruit was raised throughout the state, especially of apples. A discussion on black walnuts left the impression that they were short lived in exposed places, but did fairly well in moist, sheltered localities.

Mrs. Ida M. Millers, in a paper on native fruits in the northeast part of state, reported the sand cherry, Juneberry and high bush cranberry as being valuable native fruit; also black raspberry and choke cherry as being good.

Your delegate here read a paper on fruit culture in southwestern Minnesota.

J. A. Carlton stated that the Whitney blighted some, but the Wealthy bore better than he ever knew it to in Wisconsin.

The evening session was opened by A. Norby, of Madison, with a paper on "Evergreen Windbreak." He recommended especially the northern red cedar. Discussion developed the fact that the northern red cedar was the preference of most, the Scotch pine was short lived, the Norway spruce not quite hardy. The Austrian pine, white spruce, blue spruce, Black Hills spruce and the Black Hills, or bull, pine, were also well spoken of. The white pine, balsam fir, arbor vitae and hemlock were generally considered as no good. The secretary said they should be discarded from the state. Mr. E. D. Cowles, of Vermillion, said a wire netting made the best of protection for a young evergreen. Mr. A. Norby recommended giving the young evergreens winter protection by laying them down and covering them with earth for the first three or four winters. This was considered a most important point for prairie planters. Mr. D. F. Harrington recommended the juniper savin for a low evergreen hedge. It was shown by Messrs. Whiting and Norby that in the Black Hills the rainfall was greater than in the surrounding country; that the Ponderosa, or bull pine, had taken possession of the southern slopes, and the Black Hills spruce had taken the northern slopes, only higher up on the hills, where the rainfall was greater. Mr. Whiting mentioned the beautiful silver cedars he had seen in the vicinity of the Bad Lands.

Mr. D. F. Harrington, of Sioux Falls, here read an interesting paper on "Ornamental Shrubs." Other papers were read, but it was getting late, and my notes here are mostly blanks.

Wednesday Morning, the 23rd.—About sixty persons were present. Mr. C. E. Older, of Luverne, Minn., read his paper on "Currants and Gooseberries for Profit." Each family should have three or four dozen plants—set at two years old, four by six feet. Cultivate well for two years; then mulch and allow no weeds to grow. Never divide an old currant bush to get sets from.

Paper of C. W. Gurney, on "Commercial Strawberry Culture." He recommends Crescent, Bederwood and Warfield. It is necessary to get a full stand the first season that rows should be only about three feet apart, thus not allowing too wide matted rows. He recommends the Bederwood as being the best single variety for home use. Mr. C. E. Older reported 800 quarts grown upon eight square rods of ground.

The mole was recommended as being of value to the fruit grower by his destroying a great many white grubs.

Thomas Hobart, of South Sioux Falls, on "Market Gardening," says, plow in the fall, six to ten inches deep, and harrow every week or ten days until the ground is planted. This is most important on land that is to be planted late in the season. The garden, as far as possible, should be planted in long rows and in one body. After cultivation is done, a one-horse Breed's weeder should be used, going crossways of the rows. In this way hand weeding can nearly be dispensed with.

E. F. Atwater, secretary of the Beekeepers' Association, of Yankton, says bees accomplish perfect fertilization of bloom of fruits and some vegetables in rainy weather when other insects do not work. Bees cannot puncture sound fruit. Mr. Gurney says bees do not work on the strawberry bloom.

Wednesday Afternoon Session.—About sixty present. A letter was read from President H. C. Warner, who stated that on account of sickness, he could not be present. A resolution of sympathy was passed.

Mrs. L. A. Alderman's letter stated that she had sold her orchard and should retire from the business. Her paper stated that the Tetofsky was a fine harvest apple. Plant a few Whitney No. 20, but the tree is short lived and is a poor self-fertilizer. The Wealthy is the apple of all apples and should be planted on rather low land. The Virginia crab should take the place of most other crabs.

A paper on plums was here read, from Martin Penning, of Sleepy Eye, Minn. He recommended the Surprise, Cheney, Aitkin and Odegaard for early; De Soto and Wyant, Comfort and Stoddard. Plant in rows, sixteen feet apart and twelve feet in the row.

Mr. A. Norby here gave a very interesting talk on plums. He thinks the Odegaard one of the very best. Your delegate here made a little talk, in which he endeavored to make friends for the De Soto and the Wyant.

"Top-Grafting a Commercial Orchard," A. D. Doungan, of Plankinton (near the Hills). He said Virginia crab is the hardiest and makes a good root formation on the scion better than the others; hardiness above ground does not count when the trees are on tender roots. The Virginia is the best crab to fruit or to top-work on; plant trees and mulch during winter; plant only Duchess, Wealthy, Whitney No. 20 and Virginia crab.

C. W. Gurney thinks we should go slow on crabs of all kinds, as they propagate and spread blight, and sometimes ruin fine orchards.

C. Thompson, of Rapid City, Black Hills, reports many varieties of apples and plums that are usually tender in the northwest as being hardy, leaving the impression that the vicinity of the Black Hills is quite favorable to orcharding.

Mr. E. D. Cowles, who lives near the Missouri river, says he lost his Ben Davis three times by sunscald, trimming up the sprouts to make trees of them, but they sunscalded each time. Now he lets them sprout at will and raises lots of Ben Davis apples on bushes. He says the cold does not kill our fruit trees, but the hot sun of

February and March starts thousands on the road to death (by sunscald). He always tries to get a branch started low down on the south side of his apple trees.

In a discussion on a windbreak for the orchard, the opinion prevailed that a windbreak did more harm to the fruit trees by sapping the ground, than it benefited them. This discussion, more than anything else, revealed to me that the drought conditions of South Dakota away from the influence of the Missouri river are still more severe than in southwestern Minnesota.

Prof. Hansen thought it not best to cut back fruit trees at the time of planting, but rather to thin out the branches, as the strongest buds being at the ends, if these were all cut off only weak buds would remain, and the trees would not make as good a growth. As to windbreaks, the professor stated that the rule was, a tree gave a protection of sixteen feet to every foot in height, or at the ratio of sixteen to one, and was inclined to favor the windbreak for the orchard.

The Northwestern Greening was well spoken of by a few, but it was very plain from the papers and discussions that the Wealthy apple was fully as popular in South Dakota as it is in Minnesota.

C. W. Gurney's paper on "Propagation of the Plum and Apple," says it is as important to have hardy roots on trees as it is to have hardy tops. In the nursery two years ago we found but little injury above the ground, but the roots were killed. "Talk about their root-killing because the ground was dry! That is not the case; many trees froze up in mud, and they thawed out in mud, but the roots were killed just the same as the others. The yellow Siberian seedlings did not root-kill." He recommends using no stock for grafting the apple except the yellow Siberian seedlings, and they should be budded or grafted at the ground surface. Of the plum, we want no trees on Marianna or Myrobolan stocks; wants only the Americana to graft plums on, but says the sand cherry will do for stock and is perfectly hardy.

Mr. Whiting says trees often root-kill worse when the ground is wet. Trees sometimes root-kill by dry freezing, but thinks starvation on account of drought weakens the trees, and they fall an easy victim.

Wednesday Evening Session.—W. B. White, of Olivet, reports the Loudon raspberry not hardy without winter protection; white grubs destroyed many strawberry plants in new setting; but few apples will stay on the tree unless it has a good windbreak.

Mr. E. D. Cowles and others told of agents or dealers taking a large number of orders for Russian hedge plants and honey locust, promising them Russian olives (Oleagnus), Russian pea trees (Caragana) or Russian osage. One man gave $100 for enough plants to set 100 rods, and in every case the common Osage orange was delivered instead. Prof. Hansen said there was no such plant as Russian osage, and that the osage orange would not live long enough in South Dakota to injure fruit or anything else.

R. L. Kelley, of Worthing, reported trying to raise apples for the past fifteen years, but has yet to mature the first specimen, and advises those who want to grow apples to move to Oregon or to

Washington. Says we can grow plums, but thinks the supply of cherries will never be equal to the demand of the birds.

Mrs. Downer says the little, almost invisible red spider is the greatest enemy to house plants and washing them in soapsuds is a certain remedy, two applications being sufficient.

E. D. Cowles on "Out-Door Flowering Plants," plants mostly in rows five feet apart and cultivates with two-horse cultivator. Bachelor button is the most popular flower; phlox, poppies, zinnias, sweet peas and pansies are among the best; sweet peas and pansies will not stand cultivation; a bed of poppies eight feet wide and 160 feet long could be distinctly seen one mile away.

Hon. H. W. Lathrop, of Iowa City, Iowa, in a paper on "How to Produce the Coming Apple of South Dakota," said, plant trees of the Malinda along with the Duchess, Whitney, Hibernal, etc., where the pollen will mix, or take the same class of trees and top-work with Malinda and plant seeds of the latter. Mr. C. W. Gurney expressed himself as being almost of the opinion that if the art of grafting had not been discovered, and, instead, our attention had been directed to plant breeding, horticulture would have been further advanced. Prof. Hansen was of the opinion that some time in the future all of our most valuable fruits will have in them more or less of the blood of our native fruits. He has seen wild crabs two and one-half inches in diameter.

Prof. Hansen here read his paper on "Breeding Hardy Native Fruits." The points came so fast that I could not keep track of them, but the general idea was that he was gathering wherever he could in the northwest and planting the hardiest of wild fruits of all kinds along with the best cultivated fruits of their kind, in such a way that the pollen would mix, and planting great quantities of the resultant hybridized seed and making selections from these hybrid seedlings. This, in the course of time, will give the northwest a pomology that is distinctly its own.

Thursday Morning Session.—I am indebted to Mr. C. E. Older, of Luverne, Minn., for the following notes of this session: Place of next annual meeting, Sioux Falls. The summer meeting will be held in Brookings, at the Experiment Station; date to be set by the secretary. The following officers were elected: President, H. M. Avery, of Sioux Falls; vice-president, A. Norby, of Madison; treasurer, M. J. DeWolf, Letcher; librarian, E. D. Cowles, Vermilion. In conclusion, will say it will pay us greatly to encourage this band of earnest workers, who never have been recognized by getting an appropriation from the state and get no reduced railroad or hotel rates—as one of the number put it, "work for nothing and board ourselves and pay for the privilege of doing it." Their papers, if printed in our reports, will be of especial value to the western prairie section of Minnesota. Although South Dakota extends quite a bit south of the Minnesota line, outside of the Missouri valley, owing to their more severe drought conditions I am satisfied that any fruits that they can succeed with in their prairie sections, we can also succeed with in southern Minnesota.

REPORT OF THE COMMITTEE ON THE AWARD OF THE $1,000 PREMIUM FOR SEEDLING APPLE.

PROF. S. B. GREEN, CHAIRMAN.

The immediate effect of the offering of this premium of $1,000 for a variety of apples as hardy as the Duchess, of as good quality as the Wealthy and of as good keeping qualities as the Malinda, has been to give our society much free advertising, in which we have been referred to in very complimentary terms for our enterprise. This has resulted in many inquiries from owners of seedling apples in various parts of the country, and in the entry of twenty-three seedling apples in this competition. Of these we have received scions of thirteen kinds. Of the scions received, eight kinds are growing upon the grounds of the Experiment Station, having been top-worked upon the Virginia crab. The scions of three varieties were received in such poor condition that they could not be made to grow, and two kinds have been received this autumn. One party, a woman, who entered the competition, says she will sell her apple tree for $1,000, but that she has nothing to give away and will not send scions—unless, I suppose, she should happen to change her mind. One variety has been ruled out of this competition because, on the statement of the owner, it is an autumn fruit.

It would, perhaps, be well for me to refer again to the plan of the committee having the matter of this award in charge. This committee plans to make and keep good, careful descriptions of the varieties entered; to grow the trees from scions sent in, on the grounds of the University Experiment Station, preferably by top-grafting upon the Virginia crab, but also by root-grafting. As soon as the fruit is received, it is photographed and described. These records are kept in the office of the Division of Horticulture at the Experiment Station, and can be examined at any time.

The parties who have entered this competition are as follows, in which list those who have sent scions are given a number which refers to the entry book of the University Experiment Station, where it is customary to give an entry number to all plants, scions and seeds received:

Date of Entry.	Exp. Sta. Number.	Address.
Nov. 12, '00	2469	A. E. Hart, Vermont, Fulton Co., Ills, Recd Autumn 1900
Dec. 5, '99	2439	Devitt Carpenter, Homer, N. Y.. Too poor for use.
Nov. 17, '00	2382	John H. Mohr, Box 321, Emans, Penn.
Nov. 14, '00	2400	Capt. L. Olson, Decorah, Iowa.
Dec. 20, '99	2384	August Ahlin, Exiter, Tulare Co., Cal.
Nov. 16, '00	2423	George Phillips, Woodburn, Clark Co., Ia.
Nov. 27, '99	2427	(1) G. Sutherland, L'Avenir, Quebec, Canada.
	2428	(2) G Sutherland, L'Avenir, Quebec, Canada.
Dec. 4, '99	2403	Fred Propp, Grafton, Wis.

Nov.	1, '99	2424	Benj. Mitchelson, Polk, Ashland Co., Ohio.
		2401	Joseph Kamer, Reed's Landing, Minn. Too poor for use.
Mar.	16, '99	2472	Mrs. M. Runkel, Klossner, Minn. Rec'd autumn.
Dec.	2, '99	2431	Edwin Woodward, Wilna, O. (Wilna Beauty) none grw.
Mar.	3, '99		Mrs. E. L Austin, Dundas, Rice Co, Minn.
Jan.	30, '00		Miss C. G. Doughty, Carversville, Bucks Co., Penn.
Mar.	25, '99		Mathias Siebenaler, New Trier, Dakota Co., Minn.
			Alexander Thompson, Uxbridge, Ont., Canada.
Mar.	1, '99		Mrs. Anna Billings, High Forest, Minn.
Mar.	31, '99		Hans A. Clausen, Evans, Minn.
Nov.	15, '99		Mrs. Daisy S. Haycroft, Madelia, Minn.
Feb.	12, '00		J. E. Hickernell, Saegertown, Penn.
			W. N. Norwood, Rhea, Ark.
Nov.	21, '99		Eaton T. Donnell, Donnellson, Ills.
Jan.	16, '00		T. A. Church, Stony Fork, N. C.
Oct.	8, '99	2377	R. Derby, Jr., Florence, Erie Co,, O. (Derby A.)
Dec.	25, '99		A. H. Gaston, Harvey, Ills.

HANDLING AND CARE OF NURSERY STOCK RECEIVED FROM THE NURSERY, FALL AND SPRING.

W. S. HIGBIE, WASHBURN.

I have no doubt that prospective buyers of nursery stock are less concerned over the question of how to properly care for their stock after they receive it than they are over the question of where to buy so as to get it in a condition that would warrant bestowing the necessary care upon it. When trees and plants are received in the condition that the writer has sometimes gotten them, the instructions of how to care for them are very simple, viz.: choose a bare piece of ground a safe distance from everything you do not wish to destroy, pile the stock in a heap, throwing what dry straw was used as packing over the whole and set on fire. This method will save work and anxiety.

Now, I may be called to account for casting reflections upon the "honest and much abused nurserymen," but who can help but feel disgusted, to say the least, after reading in catalogues the emphatic claims of excellency of stock, of superior packing facilities, etc., and after carefully selecting what is wanted and sending hard-earned cash, to receive, perhaps, passably good stock, but in the above noted condition?

But to the text. I will first consider fall care. As a rule, I would advise planters to have their stock delivered in the spring, for all well equipped nurseries have storing cellars where trees and shrubs can be kept in perfect condition through the winter. But if the nursery patronized is at a considerable distance, with the probability of getting the stock very late in the spring, it would be desirable to order for fall delivery, with the exception of strawberries,

black cap raspberries and evergreens, which should not be dug until spring.

Small fruits, noting the exceptions already stated, may be planted at once, providing some good mulching material is placed over each plant as a winter protection, or they may be kept over winter by heeling them in. Select a well-drained piece of ground where the soil is mellow; dig a trench deep enough to place the roots of the plants at least six inches below the surface of the ground; place the plants in the trench without bunching them; work the soil well among the roots and pack firmly so as to leave no air spaces. When covering, take the earth from the side of the trench, thus making a place for another row.

With trees the work of heeling in is much greater. Dig a pit two feet deep and of sufficient width and length to accommodate all the trees to be buried. Leave the bottom at one end sloping where the first course of trees is to be laid. After covering roots of the first layer, put in another layer lapping over the first, much as shingles are laid. When all the trees are in, the pit should be filled, covering root and branch. The ground where nursery stock of any kind is heeled in for winter should be deeply mulched and well soaked with water before freezing.

In case one receives stock that is frozen, it should not be allowed to thaw out in the open air, but should be heeled in at once or placed in a cold cellar without unpacking and well soaked with water. It will then thaw so slowly as to receive no great amount of injury.

When plants or trees are delivered in the spring, caring for them is a very simple matter. The box or bale should be taken to where it is cool, either to the cellar or some shady place, unpacked at once, the roots sprinkled, and all mangled ones trimmed off smoothly. If they cannot be planted right away, they may be left in the cellar by repacking them, or be heeled in in the shade, simply covering the roots sufficiently to prevent drying out. Even strawberry plants may be kept this way for ten days to two weeks by watering frequently.

Before planting dip the roots of all trees and shrubs in a puddle made of clay and water. This forms a coating over the roots and prevents them from rapidly drying out.

ROTATION ON THE SMALL FRUIT FARM.

C. W. MERRITT, HOMER.

I think the secretary sized my ability as a writer in giving me this subject, as I cannot see there is much to write about.

As for myself I rotate my plantings but little. Small fruits, except strawberries, where well set and cared for, are a fixture for several years. Ground should be well prepared, manured and cultivated before the first setting. With that purpose in view, in setting red raspberries or blackberries I run a furrow, deep and straight, through the patch. I have a hand drop the plants in the furrow about three feet apart in the row and I set them as fast as dropped, packing the earth around the roots with my fist, giving each plant a little water first. When the row is finished in this way I fill in with a shovel—or a good tool for this purpose is the old fashioned potato hook. I seldom lose any plants. I like best a single row. What I mean by a single row is that they be not allowed to spread, and then they can be cultivated as well as a row of corn. The rows should be six feet apart. When set in with a row of trees in the orchard you cannot cultivate as close, and the rows will naturally spread until stopped by the cultivator.

The exact time to dig out and reset the blackberry or raspberry patch must be determined by its fruitfulness. I leave them until they show signs of weakness, by age, or other cause, and then dig them out and cultivate the ground for one or two years in corn or potatoes or both, either of which leaves the ground free from weeds and in good shape for resetting. I like alternate rows of blackberries by themselves, a row of red raspberries either side of blackberries, and the latter don't have so good a chance to "catch on" when cultivating.

Mr. O. M. Lord: I do not know that there is any general system of rotation established. I have met with very good success in following strawberries with potatoes and corn and planting raspberries in the orchard. I have one patch, or one orchard, that has contained raspberries for eight or nine years with good success; I have reference to red raspberries. I have also had blackberries in the orchard, a couple of rows, with good success for fifteen years. It is true it requires considerable labor, but the work you put on them is very beneficial, not only to your crop of berries but to the orchard as well, and I am strongly inclined to believe that the raspberries planted in my orchard have effectually prevented what we call sun scald in my orchard, as I have not for twenty years had a case of sun scald on my place. Where the berries are planted for such a series of years it can hardly be called rotation, but where the blackberries and raspberries are taken out of the orchard, of course, it would apply. I find it very little trouble to take them out and destroy them. I have sometimes seeded to clover, but sometimes without much suc-

cess as to catch and then had to resort to the vine. I do not like their appearance, but know of nothing better than leaving them on the ground as a mulch.

Mr. Seth Kenney: I would like to ask what kind of blackberry he cultivates and whether he lays them down in the winter.

Mr. Lord: I have not practiced laying down the red raspberry of any kind, but for trial I have had nearly all the raspberries in the general market. For my own use I prefer only two or three kinds: the Turner, Cuthbert and Loudon. With the black raspberries I have the best success with the Gregg and Palmer. I do not like to have them in my orchard for a number of reasons, but I have met with excellent success with the Snyder and Briton blackberries. I have tried half a dozen different varieties, but have had the best success with the Snyder and Ancient Briton.

Mr. Seth Kenney: Do you have good success without laying them down?

Mr. Lord: The past five years I did not lay them down, and I had excellent success, good crops. To be sure of a crop I would prefer to cover them, and sometimes I have partly covered some of them, but those standing came out as good as those covered. I have never found it necessary to cover red raspberries on my place, especially the Turner and Loudon.

Mr. Oliver Gibbs: Yours is a sheltered situation, in the valley where your raspberries are, with trees surrounding them.

Mr. Lord: It can hardly be called a sheltered valley, although my place is considered one of the most valuable in the state for fruit with the exception of apples. Prof. Green and Prof. Goff told me that my apple trees blighted worse than anything they had ever seen, although I take a great many premiums with my apples at fairs.

Mr. A. P. Stevenson (Man.): I just want to say a word along that line of planting small fruits between apple trees. Our first planting of apple trees was without any planting of fruit between the trees, and we found a large percentage of our trees root-killed. After that we planted the red raspberries and red currants in the rows between the apple trees, and I found that the apple trees succeeded a great deal better than without the fruit. The small fruits did thoroughly well, and it was only last year and the year before that we found it necessary to remove the small fruits as the trees were getting too large and needed the space. I consider it a great benefit to have the small fruit between the apple trees.

Mr. W. D. Harris: Have you ever tried sweet corn between the apple trees?

Mr. Lord: I have raised good crops after taking out the raspberries, but I would not advise planting field corn.

The President: I have had good luck in planting three rows of peas, doing it with the seeder, filling up all the holes but three and dropping them along half way between the rows of apple trees on each side, and I did it for this reason: I knew that peas evaporate but little water and can be planted very early, generally the first of April and sometimes the last of March, and by planting early peas I can get them out of the way before the drought gets there, so they will

stop absorbing the water from the ground and injuring the trees before the water is needed. The peas do well. The best way to make them pay is to have some kind like the Surprise pea that sells for a good price for seed, raising a crop and selling it to the seedsmen. In that way I can kill two birds with one stone and can cover the ground during part of the season when it is necessary to do it with little expense to the fruit trees.

Mr. J. S. Harris: When I was a younger kid my father used to practice sowing peas in his orchard, a June pea. We would take a few messes of them to eat, and after those peas began to harden he would turn in a drove of pigs, and they would harrow the soil and eat the peas before the apples began to drop. He did that for two years in succession and then sowed the ground to clover, and when that came up well he would run the plow in and turn it under very shallow. He had the reputation of having the healthiest fruit and the best trees in the neighborhood, and the hogs and the fruit made a good harvest, and it saved wormy fruit. About rotating fruit crops: I have had a little experience if I am young. I have never yet succeeded in getting a second good stand of raspberries from the same ground unless I cultivated it to something else after taking them off. Now black raspberries are not profitable after three years, and in planting right in the first place, that is four feet each way, you take off two crops and then take out every other row. We find strawberries succeed admirably, and then we plant to potatoes. We also find that raspberries succeed very well after putting the ground into strawberries, but with raspberries it is impossible to get a crop from the same ground again. I had one piece of ground from which I took three thousand quarts of strawberries the first year. I run it another year and then plowed it under, and although I gave it the same care as the first year I did not get half a yield.

Mr. C. W. Merritt: In speaking about rotating strawberries, I will say that we do not raise many strawberries. We have three patches of ground we use for that purpose, and we set one of them, and the next season we plant one of the others and set the third one out to something else, and the third year we dig up the first one and reset the third one and so keep them two years apart all the time. In that way we get the best result from the strawberry land.

Mr. Harris: Is your second crop as good as the first?

Mr. Merritt: Oh, yes; we don't notice any difference. We set enough plants the first season so they thoroughly fill out the ground. As for raspberries and blackberries, they should never be set among the trees. They will scratch the trees and injure them, but I think red raspberries are excellent.

Prune off all broken ends of roots before planting the trees, always cutting from the under side. When the root is thus smoothly cut it will callous over quickly.

ROTATION OF CROPS.

VINCINT REEVES, CHAMPLIN.

I merely give you my experience of thirty years of practical work, and it might not agree with a great deal of theory that oftentimes is presented in various journals. There are very few tillers of the soil who have any knowledge of analyzing the soil; that is within the power of the chemist. Practice and science have combined to show us how all soils may be raised to the highest state of fertility, and a knowledge of the composition of crops and manures shows how we may best maintain its good conditions. Sometimes conditions occur with the market gardener so that his second crop does not reach that proper state of perfection for the labor bestowed upon it. Its cause may be traced in not having sufficient fertilizer, the soluble portion having been absorbed by the first crop. These remarks apply to the market gardener who is trying to obtain two or three crops the same season. Perhaps he has commenced the career of a market gardener on a soil deficient of plant food for such vegetables as he may have a desire to grow; therefore he is liable to have a few seasons of disappointment until the manure gets thoroughly incorporated into the soil. There is another thing to be considered, and that is, quality as well as quantity of manure.

Many years ago Mr. Joseph Harris, of Moreton Farm, a practical agriculturist, endeavored to impress on the minds of American agriculturists that the value of animal excrement depended on the food that was fed. He was extremely cautious in his experiments. We find wheat bran more valuable than corn; clover hay more valuable than timothy.

When I commenced gardening I had what is called virgin soil, composed of hazel brush and scrub oaks. When the land was partially subdued, I commenced using manure, at the rate of forty or fifty tons per acre, on the portion I desired to grow vegetables on. While I do not claim any credit to myself, for I certainly was indebted to Mr. Peter Henderson for the knowledge imparted to me, as well as to thousands of others engaged in the same business, I followed his teachings as far as practicable, with due consideration of the market to dispose of my produce, while the farmers traveling on the road thought I was slightly affected with lunacy in dressing land so heavily. They said my crops would all burn up. It was not many years after they commenced playing the same game.

My soil being thus highly dressed with reasonably good manure, I found it contained a complete fertilizer for any vegetables I de-

sired to grow. I have grown early cabbage ten or twelve years in succession on the same land, following the same season with late beets and celery. I have grown beets for ten years in succession on the same land. Radishes I have grown on the same plat for many years, followed the same season with peppers, tomatoes and egg plant.

I believe the majority of Minnesota soils, if highly dressed, will grow anything for a number of years in succession, barring droughts and frost. I have never paid any attention to rotation of crops, though it is true I discovered in about fourteen years the warning given by Mr. Henderson that where the soil was so heavily dressed it became somewhat like a member of the human family that had been surfeited with rich food and required a change of diet. So the soil required a rest by feeding it with clover, or any leguminous crop and plowing it under. Dame Nature was then restored and ready to be treated as before, and would cheerfully respond after being tickled with the hoe.

There is one thing that tillers of the soil in Minnesota can congratulate themselves on, they are not spending any money in commercial fertilizers. I find in the year 1896, according to reliable statistics collected by Mr. John Hyde, verified and compiled by American Agriculturist, that twenty-seven states purchased two million tons of commercial fertilizers at a cost of forty million of dollars, and no record that Minnesota expended a dollar. Wisconsin was the farthest western state on the list. We would infer from this that the soil of Minnesota is not yet impoverished so as to require any but home made fertilizers. It may be a fair conclusion that her system of farming will be greatly improved by rotation of crops, clover being the principal change crop, and in the future her products will increase with the knowledge disseminated by our experimental stations, and by reliable agricultural journals, not forgetting Mr. Terry with the farmers' institute.

Evaporation from Different Soils.—In some tests made at the Colorado station as to the amount of evaporation from different soils, it was found that from an upland soil of mulatto color in which there was a small amount of clay and considerable sand with enough lime to cement it and render it quite hard, 1,038 tons per acre evaporated during 85 days. From a very fine black soil from the hilltop 527 tons evaporated. From a rich clay soil, very dark, 425 tons, and from a fine, light colored soil, commonly called gopher clay, 600 tons.

COMMITTEE ON OBITUARY.

J. S. HARRIS, CHAIRMAN.

Mr. President and Members of the Minnesota State Horticultural Society:—While we congratulate you on the prosperity of our society, its increasing membership, the extending of its field of usefulness and the increased interest manifested in the promotion of our cause, we are painfully reminded that some of our truest friends and most earnest workers are absent. Since our last annual meeting there have been removed by death, Col. John H. Stevens, Miss Sara M. Manning, J. W. Boxell, E. B. Jordon, Maj. Alfred G. Wilcox, Mr. C. Chadderdon and H. W. S. Cleveland. John H. Stevens died at his home in Minneapolis on May 28, 1900. Since the organization of our society no loss has been more keenly felt than that occasioned by the death of Col. Stevens. He was one of the founders and charter members of our society, one of its most earnest and truest friends. His well tried integrity, his ability and capacity for work, his dignified presence and the warm sympathy of his nature, were qualities which gained for him the highest appreciation and regard of all who knew him. He was elected an honorary life member of the society at the annual meeting held at Minneapolis in January, 1880. (For portrait and biography see "Trees, Fruits and Flowers of Minnesota," 1900, page 321.)

Miss Sara M. Manning died at Lake City, Minn., April 7, 1900, aged 48 years. Miss Manning had been for many years an honorary life member of our society. She was an earnest student and lover of art and nature and well versed in the botany of Minnesota, and past volumes of our reports contain able and well written articles from her pen. (For biography see "Trees, Fruits and Flowers of Minnesota," 1900, page 241.)

J. W. Boxell died at St. Paul (date not known to your committee). He was an active and useful member of the society for many years and in 1893 became a regular life member.

E. B. Jordon died at Ontario, California, March 10, 1900, aged 62. From 1868 until 1887 he was one of the most enterprising members and workers of our society, and well known to all of our older members and the horticulturists of the state. (For biography, see "Trees, Fruits and Flowers of Minnesota," 1900, page 201.)

Alfred G. Wilcox died suddenly at Hugo, Minn., June 6, 1900, aged 59 years. He had been a member of the society but five years prior to his death. He was a most earnest friend and champion of horticulture, and had his life been spared longer, gave promise of

becoming one of our most useful and prominent members. (For portrait and biography see "Trees, Fruits and Flowers of Minnesota," 1900, page 281.)

Mr. C. Chadderdon, of Windom, had been a member of the society but two years. Of his personal history, date and circumstances of his death, your committee are not informed.

Mr. H. W. S. Cleveland died at his home in Chicago on Dec. 5, 1900, and your committee have not learned the particulars concerning his decease, but trust that some one will furnish for publication in our magazine a suitable biography of this useful man. He was a landscape architect of the highest order, and always deeply interested in other branches of horticulture. His greatest sphere of usefulness, throughout a long and well spent life, was in improving, embellishing and beautifying parks, cemeteries, college and school grounds, and the artistic ornamentation of the suburban residences or city homes of Chicago and Minneapolis. He was an active member of the American Pomological Society in its earlier years, and one of the band of renowned horticulturists who had a place in its organization in 1848. He was a delegate from the New Jersey Horticultural Society at that time, to meet in New York with delegates from Massachusetts, Pennsylvania and other states for that purpose. At that time Marshall P. Wilder was elected its first president, and he was honored with that proud position until the day of his death on the 16th day of December, 1886.

These worthy members have closed their earthly pilgrimage, but their labors in our cause will live on to bless our state and the world, and their names will be treasured up in our memories as public benefactors.

Keeping Onions Over Winter.—Either keep them constantly but a few degrees above freezing, having a thermometer and a kerosene stove in the cellar ready for emergencies, or else lay them 18 inches thick on the floor in some outbuilding, and as soon as cold weather sets in with freezing temperature, cover with swamp hay, not far from two feet in depth, with about the same thickness of hay between the onions and the side of the building.

Do not uncover or disturb in any way until freezing weather is past, nor then until just about ready to sell. It will be best for the frost to come out before any of the hay is removed, but if it is desired to market before the frost would naturally leave, then take off a part, never all, of the hay to promote thawing. When cellar-kept, they would better be on platform and piled not over 10 inches deep.—J. J. H. Gregory.

Secretary's Corner.

"THE DUCHESS APPLE--crop here is of no value for shipment Heretofore it has not paid to put Duchess in cold storage because I have paid so much for ice ($4.00 per ton). I am now putting up my own ice and hope by improving my cold storage plant to do a paying business."—E. H. S. Dartt.

U. S. NURSERY STOCK GETS INTO MANITOBA.—"The Canadian government has just passed an order in council making it possible to get in nursery stock from the States. The stock must pass the customs between March 15th and May 15th and has to be fumigated before it can be distributed."—H. N. T.

ALL REPORTS ARE SENT PREPAID.—Most of the reports sent out from this office to members of the society go by express and are IN ALL CASES PREPAID. If the express company in any case collects express charges on these reports at the time of delivering, take a receipt and send it to the secretary, and the money will be refunded.

ORIGIN OF THE "MOULTON" APPLE.—"I desire to make a correction about the Moulton apple. In looking over an old order book of the late Peter M. Gideon, I saw in the list of apple orders sent out one variety under the name of MOULTON and supposed it was one of his seedlings. Recently, in talking with his oldest son, Ansel, I learned that this variety was procured from the old Moulton nursery in north-east Minneapolis and is nothing more or less than the White Transparent, a Russian variety."—Wyman Elliot.

A PROSPEROUS SOCIETY.—The Massachusetts Horticultural Society offer this year in prizes: plants, $2,000; flowers, $2,500; fruits, $1,700; vegetables, $1,200; gardens, $500; native plants, $175. These very liberal premiums emphasize a plethoric treasury. This society was organized seventy-one years ago. Fifteen years later it built its first hall, moving twenty-one years later into larger quarters. The holdings of this society have increased to a very large sum, making it probably the wealthiest organization of its kind in the country.

INSECTS INJURIOUS TO CULTIVATED PLANTS.—The annual report of Prof. Otto Lugger, State Entomologist, just received, is of special value to the fruit growers of the state as it contains a very full list of the bugs infesting fruit trees, plants, etc., giving accurate descriptions, accompanied by plenty of illustrations and suggestions as to methods of repression or extinction. If the reader is interested in this important subject, a copy of the report can be had without expense by addressing the author at St. Anthony Park. The book contains 259 pages and is well indexed for convenient reference.

THE FORESTRY ASSOCIATION SEEKS AN APPROPRIATION.—A bill has been introduced into the legislature, which, if it becomes a law, will place in the hands of the Minnesota State Forestry Association $1,500 a year to be used in the furtherance of the valuable educational work they are doing. We hope it will pass, and if you are equally interested in its success you can aid very much by writing to the representatives from your district in regard to it. The association has had no appropriation the last two years but has still succeeded in doing considerable work.

THE WESTERN HORTICULTURAL SOCIETY—located in Manitoba, with headquarters in Winnipeg, holds its annual session this year on March 14th. Our society will be represented on that occasion by T. A. Hoverstad, Supt. of Exp. Station at Crookston. Prof. S. B. Green is also to be in attendance as guest of that society.

Our Manitoba brethren in horticulture have been fortunate in securing from the government recognition to the amount of $200 per annum for expenses and the printing of their report.

PATTEN'S "SOULARD HYBRID"—A correspondent has evidently misunderstood a reference to Patten's "Soulard Hybrid" which appeared in the biography of Mr. Patten, in the November, 1900, Horticulturist, to be in fact a claim that he originated the Soulard crab. The variety referred to is one of Mr. Patten's seedlings, a cross, as he thinks, of the Soulard crab with a Pippin apple. In describing it he says "It has no value as an apple except as it marks a decided step in the development of the native wild crab." He is still endeavoring to improve upon the "Hybrid."

ARKANSAS STATE HORTICULTURAL SOCIETY.—"I came here from Ohio twenty-one years ago. We organized a State Horticultural Society soon afterwards. It has been slow, hard work building up our society. Our membership has been small, and our state has never given us any financial aid. We have had no income except from annual dues ($1.00) from members. All this has been required to meet current expenses, hence we have never been able to publish the proceedings of our society except in our newspapers. Our membership is now growing, and a much greater interest is being taken in horticulture. We are asking and expecting our legislature (now in session) to make an appropriation to publish the proceedings of our society and otherwise aid it in its useful work."—W. K. Tipton, Secretary.

THE CULTURE OF GINSENG.—"There has been much interest shown lately in the cultivation of ginseng. In fact, I am inclined to think there is rather more of a craze on this subject than is warranted. I have many inquiries for plants and seed, but I do not know any one in this state who has either for sale. Nine years ago we bought several hundred plants from an Indian trader at Fergus Falls and set them out on our grounds in as good a situation as we had, but we lost them by the drought of 1894. There are probably many sections of this state where this plant is obtained in small quantities, but I do not know to whom to direct inquirers and would be glad to know of some one who has either roots or seed to sell. It is a very easy matter to obtain roots or seedlings from North Carolina, but it has been a question in my mind as to whether the stock from so far south would be hardy with us, and with a view of testing this last October I bought 200 roots from North Carolina, which we shall plant in the spring."—Samuel B. Green, Horticulturist, St. Anthony Park.

Who has these plants for sale?—Sec'y.

A recent communication brings to the writer the news of the death of Mr. R. H. Buttermore, of Lake City, which took place on December 10th last. The deceased first become a member of the society in 1892 and renewed the relationship from year to year thereafter till the time of his death. He has many acquaintances in the association to mourn his loss.

WM. MACKINTOSH,

LATE OF LANGDON, MINN.

[See Biography.]

THE MINNESOTA
HORTICULTURIST.

VOL. 29. APRIL, 1901. No. 4

In Memoriam.

WILLIAM MACKINTOSH,

LANGDON, MINN.

Died Dec. 9, 1900, aged 81 years.

William Mackintosh was born at Canton, Mass., March 19. 1819. His ancestors were among the early settlers of Massachusetts Bay colony and during the Revolutionary period his grandfather, Col. Wm. Mackintosh, was in charge of a brigade of Massachusetts troops under Washington during the White Plains campaign. He was also a descendent of Roger Sherman, who aided in drafting and securing the adoption of the Declaration of Independence.

The early life of William Mackintosh was spent on a large market garden and small fruit farm in the vicinity of Boston, and it was here that he learned to love the companionship of fruits and flowers, a love that remained undiminished through a long and eventful life.

For a number of years previous to 1850 he was in charge of the farm of Aaron D. Weld in what was then the city of Roxbury, now a part of Boston. In 1850 he moved to Lincoln, Mass., where for thirty years he was quite an extensive grower of peaches, apples, cherries and asparagus.

In 1880 he moved to Minnesota, where he soon after purchased a farm at Langdon, Washington county, and engaged in gardening and general farming.

Mr. Mackintosh was twice married. In 1841 to Miss Adeline Arnold, of Roxbury, who died ten years later. To them were born three daughters, who are living in New England. In 1852 he mar-

ried Miss Eliza J. Tuttle, of Lexington, Mass. To them were born eight children, two of whom are still living, John Q. and Roger S. Mackintosh.

Mr. Mackintosh was always interested in the work of horticultural and kindred societies. He took great delight in participating as an exhibitor at county and state fairs, and the enjoyment was intense if he could excel in producing the choicest specimens of fruits and vegetables.

Soon after moving to Minnesota (in 1882) he joined the state horticultural society, and renewed his membership yearly until at the regular annual meeting of the society a year before his death, upon recommendation of the executive board, he was unanimously elected an honorary life member. Until failing health prevented he was a regular attendant at its meetings. He did not lead in discussions, but was more of a quiet worker in the ranks, a man of comparatively few words in a public way, but held in the highest esteem. In the great questions in public life of his time he took much interest and in his city and town held many offices of trust. The immediate cause of his death was an attack of erysipelas, which confined him to his bed but a few hours before the end.

THE WINNIPEG MEETING.

JESSE E. ROGERS, DELEGATE FROM (NEWARK) NEW JERSEY HORTICULTURAL SOCIETY.

In company with Prof. S. B. Green I attended the annual meeting of the Western Horticultural Society at Winnipeg, March 14, 1901. Mr. T. A. Hoverstad, superintendent of Minnesota substation, at Crookston, attended also as a delegate from Minnesota State Horticultural Society and will report his impressions for the "Trees, Fruits and Flowers of Minnesota."

Having been asked by Secretary Latham to contribute a paper on my impressions of the horticultural interests of the northwest, from my standpoint as delegate of New Jersey State Horticultural Society, I cheerfully comply.

The Western Horticultural Society is a live and progressive one, and though they think they are few in numbers yet this is characteristic of most horticultural societies. The field is vast, but the earnest laborers are few. Judged by results the Western Horticultural Society is doing a great work for northwestern horticultural interests and is entitled to credit for its devotion along these lines. From among the members of this society a corps of farmers institute workers could be selected, thoroughly competent for educating the farmer in the pursuit of horticulture.

When in naming varieties of strawberries succeeding with them I heard the Wilson, Crescent and Gandy given as the best, many of the perplexing questions in pioneer strawberry culture vanished. These three varieties where successfully grown comprise the broad scope of home and commercial strawberry culture.

The Crescent, in plant growth and yield, covers the field for light soil and requires no great knowledge to be successful with; when soil becomes too rich it runs to plant growth and does not produce fruit. It is the plant for the masses, and the best one to begin with. It cannot be set alone, as the bloom is not perfect, and another variety must be planted alongside to have it fruit in paying quantities. This other variety will have to be named by Manitoba growers.

The Wilson is next in order in strawberry culture. The land must be heavier. It can be set alone, as its flower is perfect. The culture of this variety is a stepping stone to better quality. It does not succeed, as a rule, on light soil, but for heavy land is a pioneer variety, as the Crescent is on light soil.

The Gandy originated on a mucky, black soil, too dry for cranberry culture. It will fill the bill on moist, dark soil. Wherever it will succeed no fears may be had of lack of moisture for any variety of strawberry, as any lack of moisture is sure to cut its crop short. It can be set alone.

All of these varieties are abundant plant makers, and if all runners are allowed to set the plants will become too thick in beds. All useless plants are but weeds and of no use to grow; hence, the strawberry grower should be able to assign a reason for allowing them to remain. In matted rows the tendency of most growers is to allow too many plants. These tend to waste the moisture, and even if soil contains moisture enough to carry through the fruiting season too thick foliage tends to soften the berry, lighten the color and decrease size. I am inclined to think that northwestern growers do not pay attention enough to this subject but allow too many plants to set.

The red, yellow and black raspberries do well in Manitoba. In reds, Turner, Philadelphia, Cuthbert and Loudon; yellow, Golden Queen; blacks I omitted to note.

Many growers prefer Cuthbert and Golden Queen. The Golden Queen is a sport of the Cuthbert and is inclined to be rather a more vigorous grower, and is of better quality than Philadelphia. Black caps grow well and bear abundantly. All berries sell for about 20 cents a quart, and this should be a great incentive to grow them.

Currants, black, white and red, succeed admirably.

Gooseberry. The Houghton is the most hardy and considered

the best in quality of American varieties. The Industry was named as promising.

Grapes. Very few grown; too few to judge of value.

One grower has fruited a single tree of the Early Richmond cherry, severely pruned and laid down each winter.

Apples and plums I will leave to Mr. Hoverstad.

I went to Winnipeg ignorant of what I should find, not because I did not endeavor to inform myself but found no one who knew any particulars. To us it was an unknown country. I came away having very bright hopes of the future for her berry interests. As to varieties grown it is favorable and far in advance of what I expected to find. Experiments and experience in winter protection is needed, and from the papers and discussions had at the meeting I am confident these will be had. The Western Horticultural Society is doing a noble work, and its members have reached that point in their labors where an agricultural college has become a necessity. The old pioneers in small fruit culture are advanced in years and soon will have passed away. The foundations have been built, and now the rising generation must be instructed in the science of fruit growing. Dairying, cattle, sheep, swine and hogs are not the only products needed to advance Manitoba interests. Fruit, vegetables and flowers are also needed; yea, they are no longer a luxury but have become a necessity.

I return to New Jersey having great expectations of small fruit culture in the northwest.

THE FLOWER BUDS OF OUR FRUIT TREES.

PROF. E. S. GOFF, MADISON, WIS.

We all know that fruits proceed from flowers, and that flowers can come only from flower buds. If then we are going to study into the foundation processes of fruit growing we need to study something of the origin of fruit buds. For the last two years I have given much attention to this subject, and I shall endeavor to show you tonight some of the things that I seem to have found, and also endeavor to apply them so that you may be able to use these principles in your fruit growing.

It was a matter of interest to study into the origin of flower buds, but the real purpose that I had in my mind was to find some clue by which we might better control the formation of flowers and, consequently, of fruits. It is generally known that the buds from which the flowers come in our fruit trees are formed the season previous to their expansion; that is to say, the flowers that will open

next May on our plum and apple trees were formed in miniature the season before. This fact can easily be demonstrated. If we were to go into our orchards tomorrow with a good lens, we could in a very few moments discover the miniature flowers in the buds that are to open next May. The first point that we desire to learn is what time in the season these flower buds are formed. We know they are formed the preceding season, but as we do not know the precise time we are unable to prescribe any treatment that would tend to induce the formation of flowers; so the first question we will consider is, how early are the flower buds formed?

Before I speak further on this subject I wish to consider the structure of the flower bud and of the leaf bud. Two kinds of buds are recognized in our fruit books, and a knowledge of these two kinds of buds forms the basis of scientific fruit growing.

All buds are formed as leaf buds, and it is probably true, also, that all buds are capable of becoming flower buds. If this is true the leaf bud is only one stage in the life of the bud, and the flower bud is a more advanced stage. If every bud were enabled to follow out its full life history it would probably become a flower bud, and after the flower opened the bud would perish. The flower is the last stage in the life of the bud. I wish to have you bear that in mind, because it has an important bearing in relation to our fruit growing. [The speaker here showed lantern slides illustrating flower buds of the apple from the earliest stage at which they were discernible to the stage when the stamens and pistils were readily discernible.]

In the summer of 1900 these flower buds began to form the first part of July in the plum and cherry. In the apple they began to form almost two weeks earlier than in the cherry, and in the pear they began at an intermediate time between the apple and the cherry. In the cherry the blossom began to form three or four days earlier this year than last year. It is proposed to carry these observations further.

We have seen that the flowers begin to form at a particular time on at least four of our fruit trees, and it is an interesting question why they begin at this time. Why do they not begin to form at different times in different fruits? Why do not buds form flowers as fast as they are old enough? Again, why are flowers so much more numerous some years than others? If the flower is a stage in the life of the bud, why should we not have a regular formation of flowers every year, and the question comes up whether it is possible by any means to treat our trees so as to encourage them to form flowers when we want them. I have studied these questions, and while I do not claim to have solved them all, they are clearer to me

than they formerly were, and I think we may hit upon a system in the management of our orchards so that we can have flowers every year unless they are cut off by frost.

About the time the flowers commence to form, the growth of the tree ceases. It has been ascertained by different observers that, as a rule, the growth of wood in our fruit trees ceases about the first of July, and it is an interesting coincidence that about the time the wood stops growing the flowers begin to form. How long after this they continue to form is not yet clear. This past season the buds continued to form until they were checked by cold weather, but whether there was a continuous formation from July to cold weather, or whether there was a cessation and a recommencement remains to be proved. I noticed that last season there was a general second growth in our apple trees, and after that second growth we found that flowers were forming rapidly. Whether they stopped forming before that second growth was not ascertained. The point I wish to bring out is that after the wood growth comes to an end the flower growth begins. This brings up an interesting question in relation to the flower growth and the wood growth. I have ascertained in other experiments, and it has been generally known, that a cessation of growth will often cause flowers to form. In other words, the conditions that are favorable to growth are not generally favorable to the formation of flowers and vice versa. To state the case in another way, flower formation opposes growth and growth opposes flower formation. We can prove this in many cases. The florist understands full well that if he wants his flowers to bloom well he must not give them the conditions to grow well. If he wishes them to flower he gives them less water, and by checking the growth he can bring on flowers. If he wants to make the plant grow he gives it plenty of water and heat. We all know that during the early part of the season we have a very rapid growth in our fruit trees. We know pretty well that during the period of rapid growth we cannot have flowers formed for next year. It is only after that growth comes to an end that flower growth begins. The question arises, why do trees grow fast early in the season, and why do they stop growing before midsummer? It is well known that an abundant water supply produces rapid growth. Every farmer knows that his corn grows faster in hot, wet weather than in warm and dry weather. During the winter there is little evaporation from our fruit trees as compared with the summer season, because the leaves all fall in the autumn. The roots of the trees, however, do not undergo such a radical change. They are not checked in their natural functions to the same extent as the branches, but they con-

tinue to absorb water during winter weather, unless the ground about them is actually frozen, and as the water does not evaporate it accumulates in the tree. It is known that the tree is full of sap the latter part of the winter; that is the reason we can draw maple sap in early spring. When the warm weather comes they are in the best possible condition for growth, and we have a very rapid growth early in the spring because the branches are all gorged with water. After the leaves come out, evaporation becomes rapid, and the roots are not able to keep up with the evaporation; hence, the water supply begins to dwindle. The leaves are continually evaporating water, and the new leaves are expanding, and they have to be filled with water; hence, as the season advances there occurs a decided dearth of water, and the trees cannot maintain the rapid growth they have commenced. The roots may be able to keep up the supply in summer weather sufficient to prevent the leaves from wilting, but they cannot furnish water enough to grow on; hence, the growth comes to an end. And what results? The sap changes in composition because the leaves continue to evaporate water, and as the water supply diminishes the sap becomes more concentrated. It has long been recognized that when the sap becomes stocked with the proper food, when the sap acquires a certain consistency, it is then in condition to form flowers and not before. We can demonstrate this by experiment. It is well known that if you girdle the branch of an apple tree, cutting around the branch and removing the bark from the tree, the part of the tree that has been girdled will produce flowers in many cases. In this way trees can be caused to fruit several years earlier than otherwise. What have we done in this case? We have cut in through the bark but not into the wood. It is well known that the food that is prepared in the leaves goes down through the inner bark, from the leaves into the branches, from the branches into the trunk and from the trunk into the roots. All the growth that is made has to be made through the leaves. If we remove the inner bark we interrupt the current of prepared food, consequently the water will pass off through the leaves, but the food that is formed cannot pass down. The result is we have a thickened stem above the girdle and a formation of flowers, showing that an accumulation of food causes flowers. As I have said, it is only where there is an accumulation of food that the flower is formed. Every observer knows that the first flowers and fruits on a young apple tree are formed on the short branches that leave the main branches at nearly right angles. The union of the two branches causes the bark to wrinkle and acts to a certain extent like girdling, causing an accumulation of food that in turn causes flowers to appear. During the

latter part of summer, when the water begins to get scarce, the sap becomes of the consistency necessary to the formation of flowers, and the flowers form first where there is the greatest accumulation —so we have apples forming on the fruit spurs.

What practical use can we make of these facts, if they are facts, in the production of fruit? The principle I stated a few moments ago gives us what I believe to be an important key to the management of our fruit trees. I said there is a law of relation between growth and the formation of flowers, and where growth takes place flowers cannot form, and where flowers do form growth does not take place. If this is true, and I might produce more evidence to show that it is true, it follows that if we can control growth we can control flowering. The conclusion is logical. It follows also that where we have normal growth we will have normal flowering in the proper season. The flowers will take care of themselves. That brings up the practical question, how can we make the growth normal? Normal growth I will define as the largest amount of growth we can have at the ends of the branches without causing shoots to start out from the older wood. As soon as the shoots start out from the old wood we may call it abnormal growth, because normal growth should be at the ends of the branches largely and not in the older wood. If we have an abnormal amount of growth the shoots that are ready to form flowers will commence growth, hence there will be a loss in the formation of flowers.

How can we control growth? It is absolutely necessary that we should have a certain amount of growth, because, as I have said, when the bud blossoms it perishes. If we do not have new growth we do not have new buds formed, and our tree will come to an end as fast as the flowers form. It also follows that if we have an abnormal growth one year and an abnormally large development of flowers the next year, our tree will be checked so we will have to give it time to make up the loss. What we want is a certain healthful amount of growth every year to furnish flowers for the next year, because these flowers must come from the buds formed on the new growth. This growth needs to come to an end in midsummer to give the flowers a chance to form. Now our business as fruit growers is to apply all our energies toward the maintenance of that regular condition of growth. Of course, we cannot control the climate, but we can modify the effects of climate largely by treatment, and we can modify growth by pruning. Some farmers prune once in three or four years and then overprune. The result is an enormous growth of sap sprouts. That is the worst way any one can treat the orchard. How shall we prune? Prune enough each

year so that the light can shine between the branches to enable the buds to form flowers, but do not prune enough to stimulate an excessive growth in any part of the tree. Remember if you over-prune you postpone fruitage by interrupting the formation of flower buds. We can also modify growth by the use of fertilizers. I have said that growth should take place early in the season. We should fertilize in such a way as to stimulate early growth but not late growth; that is, we should apply some quick acting fertilizer early in the season. Whatever fertilizer we use on our apple trees should be in a thoroughly decomposed condition. Again, if we wish our trees to make rapid growth, they should be full of water in the spring. In our climate we usually have a dry autumn and sometimes dry winters. Our trees should have plenty of water during autumn, winter and spring. How to give them this is a question for each orchardist to settle for himself. The windmill can be brought into use in some cases. In the fall evaporation is slow, and we can use a windmill to advantage.

I wish to speak briefly of the effect of root killing on fruitage. Recent observations lead to the conclusion that root killing occurs to a greater or less extent nearly every winter. Root killing is the same to the tree as root pruning. I do not know that it makes any difference to the tree whether the roots are frozen off or cut off. The tendency of root killing is to cut off a part of the water supply of the tree and hence to check growth and to stimulate fruitage. This is probably one reason why our fruit trees do not grow so large here as in the east. We do not want to check the growth early in the spring, and so root killing is a disadvantage, but it probably tends to fruitfulness.

We can control the water supply during the summer to some extent by cultivation. Suppose we have a wet April or May, as we sometimes do. There is danger that the trees may remain full of water too long, and we would rather not have an abnormal growth of wood as it would tend to cut off our flower crop. By deep cultivation and keeping the ground rough, we can do something toward drying off the ground. On the other hand, if the ground is dry and we are afraid the trees are not going to get a normal amount of growth, we can modify the condition by keeping the surface of the ground fine and smooth. Suppose June is a wet month and we are afraid our trees will continue growing too long. We can check the growth by running a subsoil plow between the rows in both directions. Thus we can control very largely the water supply to our trees. There are some dry seasons when we are at a loss to know how to supply sufficient water and our trees are suffering, but those seasons do not come very often.

In regard to our treatment for insects and fungi. We must not let these enemies feed on the leaves of our trees if we can help it. If we have it in our power to control these things we are not doing half our duty unless we do control them. We have learned pretty well how to control fungi and insects, and we must put our knowledge into practice.

In conclusion, I want to say a word about the value of education in fruit growing. The remark is sometimes made slurringly, that the farmer can raise as good or better crops than the professor, etc. That is all true; but the question is whether the farmer can learn as much about the deeper questions connected with farming and fruit growing as one who has the time and apparatus to study these questions, and if he can not learn something of value from these investigations. If this kind of information will help a young man to grow fruit, then it is worth while to send our boy to the agricultural college and let him learn all that is to be known about the deeper and more intricate questions that affect our fruit trees. (Applause.)

DARTT'S PARK AT OWATONNA.

This private park, though given freely to the use of the public, contains about twenty acres of land, through which Maple Creek passes. Much leveling and excavating has been done. Old chan-

SCENE IN DARTT'S PARK.

nels have been cleaned out and made wider, forming lagoons. Three dams have been erected securing more than three acres of water surface of sufficient depth for bathing purposes. The water comes from our mineral springs and is likely to heal while it purifies. There are three wooded islands. Straight lines are ignored and curved and irregular lines are the rule. A leading feature is the numerous driveways and walks that meander along shady and grassy banks by the side of still water. Everything is original, like the owner of the park. As a play place for the people it can hardly be surpassed. Who will follow so worthy an example?

SCENE IN DARTT'S PARK.

The best evidence of intelligence, enterprise and good taste in a community is to find in it a well located, well arranged and well cared for public park. In locating a park it is best to secure if possible a nearby place, with plenty of shade without waiting for trees to grow and plenty of water. A park without water is a very tame affair. A site extending along the banks of a river or lake is desirable. If banks are low, perhaps excavations can be made forming lagoons, which may add beauty to an already beautiful landscape. If no river or lake is available, then a creek, though small, may be utilized. Excavations may be made and dams may be erected forming little islands and lakelets that would serve as mirrors to reflect the beauties of nature in ways most charming to behold. Should water become scarce a gasoline engine will supply all demands—run gushing fountains and an arc light for each horse power of the engine.

A city without a park is not attractive. It is like a home with neither garden, lawn, fruits nor flowers—like a picture book with the pictures all left out. It may do for an all work and no play people whose God is money, but those of a more social and cheerful turn of mind who believe that all the good things of this world were made to be enjoyed can find a more congenial home in towns where nature and art combine to beautify and to charm.

VARIETIES OF PLUMS FOR MINNESOTA.

WYMAN ELLIOT, MINNEAPOLIS.

I do not consider myself an expert in plum culture, nor as having extensive knowledge about varieties in a cultural sense. I have given some time and thought to the examination of the varieties and sub-varieties exhibited at our state fairs the past four years and have gained much valuable information from cultivators of the plum that I hope some time to utilize.

Of the great number of kinds exhibited at our last state fair there are very few, comparatively, that will be found profitable to the producer or become commercially popular. There were several new kinds that had never been exhibited at our fairs. How good they will prove for culinary or market purposes can only be proven by experiment. I judge there will be but a very small percentage that will be esteemed first class, profitable kinds to the grower. Estimating the merits of any fruit by its appearance and condition upon the show table does not always give a correct diagnosis. To give a

fair and impartial judgment the person making the award should have the privilege of examining the fruit growing upon the trees and then again when it is in its best condition for testing as to quality and estimating its worth commercially.

I think we should be cautious and conservative in naming varieties or recommending too many kinds of plums for cultivation in our state. At the last state fair there were on the exhibition tables 910 plates of plums, representing over one hundred named varieties and over sixty seedlings, that I examined and tested as to quality, etc. Now, for me to say what is and what is not worthy of recommendation would be mere presumption; for there may be many that will be found equal if not superior to some of those already designated for recommendation by this society. I can say, judging from their appearance and behavior on the show table, there were some five or six kinds possessing qualifications that indicate them worthy of trial. A few of the seedlings were quite attractive in color and showed good shipping qualites. We are apt to judge a new fruit by its condition at the time we make the examination, unless we are very well acquainted with its characteristic possibilities. The fruit may or it may not be in its best condition for showing all its good points of excellency; in which case we may give an erroneous judgment. We find on comparison that of the named varieties on exhibition there were forty-six of the Americana group, six of Hortulana, two Angustifolia, one Triflora, one Nigra, one Domestica and one Cerasifera.

Our conclusions drawn from this exhibition show that the Americana plums are what the people of this state should plant for home and market purposes, but if there are those who desire to plant the other types or groups of plums to gain knowledge (dearly bought) of what is possibly adapted to the climatic influences here and can afford to meet with disappointment and loss, they can do so; but the farmer and small planters of our state wishing to grow a profitable crop should leave this class of work to the experiment stations to develop, and when they have discovered anything of value and the trees are propagated and placed upon the market in quantity and at reasonable prices then it will be expedient for them to plant these newer varieties.

The following varieties, all belonging to the Americana group of plums except one, can be relied upon as worthy of cultivation for home or commercial use, extending through the fruiting season:

At the state fair I put this question to Messrs. O. M. Lord, M. Penning and Dewain Cook: If restricted to only four varieties of the plum to cultivate for profit in Minnesota, which of the many

varieties here on exhibition would you choose? The following are their answers as given:

O. M. Lord would plant Surprise, De Soto, Rollingstone and Wyant.

Martin Penning would use Surprise, Standard, Wyant and De Soto.

Dewain Cook would take De Soto, Wolf, Standard and Wyant.

Here we have the opinions of three men who have given a large amount of attention to the growing of plums, and this advice can be relied upon.

I find on looking over the list of those varieties on exhibition there are many kinds having a local reputation of value commercially, but we as a society cannot recommend that they be placed upon our fruit list because they have been propagated only in very limited quantities if at all.

After the fair was over I collected quite a number of pits. Four years ago I planted a lot of pits, and we had some fruits from those pits on exhibition at the last fair. I discovered among those seedlings that some had much better keeping qualities than others. I think I secured those whose qualities are the best, but in the shuffle of setting up things and judging names on the show table I am not certain today that I have the correct record of them; but I am at work now trying to run them down, and if I am successful in the course of two years I will show you a plum that is a better shipping plum than anything we have got on our list today. There have been a great many plums sent to me for identification, but, of course, to do that correctly I would have to see the tree growing and would have to have a chance to examine its foliage, and I would want to examine its history from A to Z. There are a good many things that enter into the identification of fruit that many of us have not thought of. My attention was called by Mr. Lord to the pits as one means of identifiation some four years ago, and since then I have been making a study of that feature. I now have something over 105 varieties of pits, and I have got them all in envelopes, and when I get a few moments spare time I make a study of those pits. My folks at home say I am a crank. Let that be as it may; I don't know but what I am throwing my time away, but I think something valuable will come of my efforts, and I hope every one of you will not only study pits of plums but will also study apple seeds. While we have been judging apples here at this meeting, the seed has in many instances decided about the varieties. Take, for instance, the Peter and the Wealthy. Those two apples are so much alike in color, texture and shape that it is only an expert can tell the difference. If any one will take the Peter and cut it up and cut up the Wealthy and lay the two side by side, arranged so they can be seen as the seed appears in the apples, you will see a marked difference. When you come to the calyx tube you will find there is another marked difference, and when you take off the skin and take a knife and quarter them you will notice another marked difference. There

is a difference in the flower, but it is very slight, and when you come to the wood you can see there is a slight difference in the coloring, and when you come to examine the leaves you will see there is a marked difference, and you can convince any one who claims otherwise that there is a difference. When you go out to the orchard and see the trees growing side by side, without making a critical examination you would say they are alike. How it is in the nursery row I cannot say; I have made no investigation there and have not had a chance to examine the color. Here is a chance for study. We know this, that the Wealthy will not keep as well as the Peter. Mr. Gideon, two or three years before he died, told me the Peter was a much longer keeper than the Wealthy, and he said he had kept it until June in an ordinary cellar. I have kept the Wealthy where I could keep it in a cool cellar until March in good condition.

Mr. H. F. Busse: I would like to ask whether these lists are intended for home use, for market or for fresh use?

Mr. Elliot: They are for both.

Mr. Busse: I don't see why some of the others have not been mentioned.

Mr. Elliot: There are many varieties that are perhaps equally as good as those mentioned, but this list is limited to four varieties. You can extend that to six or eight varieties and, perhaps, have some that are just as good as those mentioned.

Mr. Martin Penning: I have sixty-four varieties, and last year I sold sixty-four bushels of Surprise at $1.50 a bushel—I sold the Stoddard at $1.50 and a number of the standard plums averaged $1.50. We have got to have different kinds to get a good price.

Mr. Busse: The late plums bring the biggest price.

Mr. Penning: You have got to have a plum the people want, and you have got to sell them just before they are soft, and they want them large for peeling, all of them. Nobody wants a small plum.

The President: What plums peel readily when ripe? I think that is an important point.

Mr. Penning: I think the best one is the Surprise. You can peel that when ripe just like a boiled potato, and if you dip them in boiling water you can peel the skin right off. Of course, you don't want to let it get too soft. I am willing to state that as for a number of years I have sold all I could raise and propagate of the Surprise I am now willing to take off any restriction and throw it open to all plum lovers, and I want them to plant and graft it and do the best they can with it, and at the same time I want to extend my thanks to Prof. Green, Prof. Goff and Prof. Craig for helping me to introduce that plum. I had all kinds of calls to sell the tree, but I want to throw it open to everybody. (Applause.)

Mr. C. G. Patten: I want to say in view of the opinion that has often been expressed that the Wealthy and the Peter were alike, if one will go into the nursery, while they look very much alike and the ordinary observer would not detect the Peter from the Wealthy, yet they are distinct. Looking along both rows of trees one can say positively that they are different individual trees.

CLOSE PLANTING OF TREES.

J. S. HARRIS, LA CRESCENT.

I want to say a word in regard to the close planting of trees. I plant my trees too close because I have not land enough; I plant on other people's land; I have three or four orchards in different places. I want to condemn the close planting of trees in our district. All the trees where they stood twelve to sixteen feet apart this year dropped their fruit a long time before they ought to have done so. In my opinion the sap went into the growth, and the apples went on the ground, and I don't believe close planting is a good thing. There is another objection. Where trees are fifteen to sixteen years old all the lower branches are shaded and the fruit is light in color and inferior in flavor, and you have got to have a tall step ladder to get up to the fruit. I condemn too close planting; I think it is injurious. I noticed another thing. I had one Duchess tree that stood a number of rods from any other tree, and it did not drop its fruit. All the others dropped their fruit very badly. This one always produced very good crops, and I got good specimens for the state fair when the others had been gone two weeks. The quality of the fruit is a great deal better. Some seasons I could take as much fruit from that one tree as I could take from six planted close together. Where trees stand close together like that the fruit ripens a good deal earlier and is poorer.

I think it is a bad plan to let an orchard get set over with June grass, because it will shed rain better than any roof you can put up. You will find dry ground more frequent under blue grass than anywhere else.

Mr. J. S. Trigg (Iowa): You have been engaged in fruit growing forty years. What have been the two or three valuable facts that you have learned in those years of experience down there that you have been engaged in fruit culture?

Mr. Harris: One of those facts is that you must give the trees plenty of room; another is that cultivation is better than any other treatment. I used to keep the weeds off as clean as this floor and then mulch, and about the first of September I used to rake the ground with a rake. Another is that on account of the fact that in late years insects have become rather plentiful you need to spray or use traps to catch the insects. I think if a man would place bands around his trees in the orchard he would accomplish as much in that line as he would by spraying. Those are the three principal things: the trees need room, they need cultivation and they need spraying or the use of some method to keep off insects, but I have never yet learned a way to keep the gougers out.

Mr. Trigg: Does the tree "gouger" get after you sometimes? (Laughter.)

Mr. Harris: Here is another thing I have learned: Never buy a tree from an agent. I will wager you that if an agent were offered $500 to come to my place he would not come near.

This whole country is flooded with men who say they represent certain nurseries. If you corner them they deny that they are representing the nursery they claimed they were. I learned by sad experience twenty-five years ago to let those fellows severely alone. Go to the nursery direct if you can, and if not send your order direct. Be sure the agent you are dealing with is representing a responsible nursery—then trade with him. The agents that are sent out ought to be horticulturists. They ought to be able to know what a tree is; they ought to be able to distinguish the variety; they ought to know what kind of a location an orchard would do best on; then if sent to a farmer they could tell him what varieties would do him the most good in his family orchard and could tell him on what part of his farm to plant his orchard and how to prune them and how to take care of them—then those agents would almost be angels—but the nursery sends out the man that is the best talker, and the best talker is the man who can tell the biggest lies and can prove them.

Mr. W. L. Taylor: Does Mr. Harris want to apply what he said to his locality or to the prairie country? I notice where they stand thickly on the prairie they stand all right, but where they are far apart they don't amount to much.

Mr. Harris: I would set a shelter belt, and I would plant my trees not quite so far apart, but I would not set the trees closer than twenty-five feet apart.

Mr. Taylor: How would it do to alternate the apple trees with forest trees and then cut them out after a while?

Mr. Harris: You might cut the apple trees out after a while. (Laughter.)

Anon. Don't you think setting a row of native plums would make a good shelter belt? I believe Mr. Kimball had some plums, and I know another place where he lost some by root-killing two years ago, and I believe if he had had a shelter belt of native plums he could have saved them.

Mr. C. E. Older: It seems to me there is one point that we have lost sight of. On Mr. Harris' place he cultivates on both sides. If we set trees we have to set them close together. The wind sweeps across our country, and we have to have shelter belts, and we can get our rows north and south inside of our shelter belt close together and let one tree protect another from sun scald, and still have an open space for the air to circulate through. I know an orchard of Duchess where they get three hundred bushels of apples every year.

Mr. O. M. Lord: In Mr. Philips' orchard, at West Salem, Wis., any one can stand and look as far as the eye can reach in every direction. He says from his long experience he does not want any better windbreak than a few rows of Malinda apple trees.

APPLES.

J. S. TRIGG, IOWA.

I happen to come from the land of the five Cs: cows, creameries, cheese, clover and corn, and we also raise apples, and nice apples too. We have gone through a trying experience in northeastern Iowa in our efforts to grow the apple. Every orchard set out would grow for a few years, but finally succumbed, and now every one is doing his best sowing the seed and trying to get an apple that will stand the winter. Yet it is true we credit Minnesota with giving us the best apple we have at the present time. The Wealthy apple, originated by one of your citizens, is proving a great success, and nearly every man who raises the Wealthy apple gets a lot of nice fall apples. In our state we have much promise in the Northwestern Greening, and at the recent meeting of the Northeastern Iowa Association reports from this apple were received from nearly every part of the state, and in nearly every instance the report was favorable to the Northwestern apple. It has not had a test winter yet. It keeps with us perfectly packed in a barrel placed in an ordinary cellar until the last of February or the first of March—just with ordinary care such as you give your potatoes. The tree is entirely hardy under the conditions we have had up to this time.

Mr. R. H. L. Jewett: What do you call a test winter?

Mr. J. S. Trigg: I don't know just what a test winter is. The conditions under which so many of our trees were destroyed down there in 1885 were peculiar. There was no frost in the ground. We had a quantity of snow and warm weather in February and then a very severe frost after the sap had started. It was not the cold, it was not your trouble that killed the trees, it was too much summer at the wrong time of the year. That is a condition we cannot guard against. The atmospheric phenomena like that may drop down at any time. This apple (indicating the Northwestern Greening) is a greater bearing apple than the Rhode Island Greening, and it is a better apple than the Patten Greening. The Patten Greening stands well with this apple in point of hardiness, but we are liable to have conditions arising that will kill every apple except the Siberian crab, and the progressive orchardist should keep on planting. I place the limit of the life of the average Wealthy tree in our vicinity, while they are thrifty and bear very heavily, I place the limit at about twenty years, and I think the man who wants plenty of Wealthy apples must keep on planting them. I doubt very much whether any man in this audience will ever get a saw log out of a Wealthy apple tree growing in Minnesota. The conditions are not favorable to the continual growing of the apple. At this season of the year we see the trees with as many leaves on them as they had in the summer; I don't know whether it is going to hurt them or not. I went out into a nursery at Iowa Falls last week where the leaves were hanging on the trees in that way, and I made a particular examina-

tion of the condition of the wood with a view of determining whether it was so very immature and whether it was likely to be injured. The color of the wood did not indicate that it was injured yet, but in the nursery row there were certain varieties that made a large growth this year, some that made a growth of five and one-half feet this year, and I presume you would find the tip of that growth tender this year. It will certainly kill back this year. For myself I wish the leaves were off the trees.

Mr. J. S. Harris: Is the Patten Greening a favorite and popular apple in northeastern Iowa? In portions of this state it has done remarkably well for the last three or four years.

Mr. J. S. Trigg: Well, so far as in me lies I will tell the truth about the Patten Greening. The apple was originated within fifteen miles of where I live. I was acquainted with the mother tree. I have watched the tree in the nursery row and in the orchard. I believe these to be the facts: So far as I can judge, it is as hardy as a bur oak tree as a tree. I think it is fully as hardy as the Hibernal. The bark will remain green and smooth on the Patten Greening long after it has roughened up and assumed another color in other kinds of apple trees. It bears early. Mine have borne at four years from setting. But it sheds its fruit very badly the first two or three years, partly for the reason that the fruit on the young trees grows too large, so large, in fact, that the stem is not sufficiently strong to support an apple of that weight. The Patten Greening, unless you can keep the tree protected from wind—a wind that will rack the tree will break off the apples—frequently every apple will fall the first year, and this last year may be one-half of them fell. You must determine that point to suit yourselves. It is a short lived apple. It ripens with us about the season of the Wealthy; it is not any later than the Wealthy, and in making the attempt to keep it I found I could keep the Wealthy much easier than the Patten Greening. I do not call it a high grade apple to eat. Still there are two or three days before it spoils when it is passable as an eating apple. I think, however, it is a superior apple for a cooking apple. I think it makes the finest apple pie as well as roley poley of any apple I know. In the family orchard I would give the Patten Greening a place to the extent of two or three trees, but in the commercial orchard I should plant eight or ten Wealthy for every Patten Greening.

Mr. A. D. Leach: Have you experienced any trouble with the apples rotting on the tree in the summer?

Mr. J. S. Trigg: Yes, and another thing, the blue jays never touched them.

Mr. Clarence Wedge: That is on account of the color, is it not?

Mr. J. S. Trigg: The bluejays do not bore for color, my friend. (Laughter.)

Mr. W. L. Taylor: How about the Good Peasant?

Mr. J. S. Trigg: I have two Good Peasant trees in my orchard, and if any one will dig them up, root, branch and all, and put in place a little yellow Siberian crab I will give him five dollars; I have no use for them. I do not think a cow will eat them.

Mr. O. M. Lord: What is the objection?

Mr. Trigg: No flavor.

Mr. Lord: What is the color?

Mr. Trigg: A dirty red. (Laughter.)

Mr. Lord: Are you sure you have got the Good Peasant?

Mr. Trigg: Perhaps I have been fooled, but those trees were sold to me under that name.

Mr. O. M. Lord: Our Good Peasant is the Anisim. I consider it a beauty, and I would not take five dollars or five times that for my trees.

Prof. N. E. Hansen (S. D.): The Russian name for Anisim in our translation means "a beauty," and it is a beauty. If Mr. Trigg had seen our Anisim, if he had seen the Minnesota Anisim from a dozen different places at the state fair, he would not have described it as a "dirty red." It has been called the Jonathan of the North.

Mr. Trigg: It may be the Jonathan on the outside, but it isn't on the inside.

Mr. J. S. Harris: What is the description of your apple that you call the Anisim?

Mr. Trigg: They are covered with a sort of bloom, a kind of a bluish cast over them, like as if they had fever and ague; but that would not be so bad, but if you cut them and undertake to eat them they have absolutely no merit. That is the apple I have got, but it is not the apple I ought to have.

Mr. J. S. Harris: Here are two specimens (indicating) of the apple we call the Anisim. They were on exhibition at the state fair eight days and have been in cold storage since. When they were just ripe they were a very fine apple.

Mr. Trigg: I have to announce with a profound sense of self-commiseration that I have been "stuck." (Great laughter.)

Mr. J. S. Harris: I used to attend horticultural meetings in Wisconsin, and there was a great diversity of opinion about the Northwestern Greening. Mr. Springer told me once that it had been killed root and branch. He said they had never endeavored to hold it over and never expected it to stand so they would get an apple. On that account I have never planted many trees of it, but for a few years it has been coming up steadily, and a great many people like it. I judged from remarks I heard at last winter's meeting in Wisconsin that when it gets old it is one of the poorest apples they have. There are two places in Houston county where the apple is grown to a considerable extent, and they said at both places they did not think much of it. They said it took a long time to get into bearing; there were many apples with dry spots in them.

Indirect manures are those which do not furnish the plant with food directly, but by freeing the plant food locked up in the soil are beneficial to crops.

FRUIT IN MANITOBA.

REMARKS BY A. P. STEVENSON, NELSON, MANITOBA.

As your president has said, I come from Manitoba as a delegate from the Western Horticultural Society, and we follow as closely as possible the Minnesota society in a great many things. I must say that the Minnesota society is the only organization of this kind whose findings are of any value to us. With the Ontario society we have very little to do because their conditions and ours are entirely different. I may say this is the first time I have ever had the honor and the pleasure of being present at any of your society meetings, although I have been a member for nearly ten years. There are a great many members in the society with whom, although I have never met them personally, I feel acquainted, especially with their ideas, by simply reading their views in the Horticulturist. One thing that we are interested in up there is this thousand dollar prize apple seedling. We hope the day is not far distant when that seedling will be discovered. I think you will derive a vast benefit from that offer.

Now, possibly, it may occur to some of the members to ask what we have been doing in Manitoba in horticultural lines, what success we have met with in the growing of trees and fruits. I will try to answer any anticipated questions as briefly as possible, because I know it is time for lunch.

Now in regard to growing fruit. It is something like eight years since I commenced growing fruit in Manitoba. You will understand that what I have to say at least has the merit of experience to back it, because I know that an experience of one or two years only is of very little value. Something like twelve years ago we planted our first Russian apple trees, about seventy varieties. Of these some have fruited for four years, bearing fair crops. We have fruited the Blushed Calville and the Gravenstein, and we have had some very fine apples. Some varieties are just coming into bearing—one named the Russian Gravenstein apple—and then we have the Anisim, Hibernal, Repka, the Little Hat, Red Twig, Lieby, Ostrekoff, Antonovka, Sugar Sweet, Saccharine and Roman. Now these varieties planted twelve years ago have borne fruit, some of them good fruit, and some of them very poor fruit. I think the best quality with us is the Anisim and Russian Gravenstein. The Hibernal is a good apple for cooking purposes. The Wealthy have borne fruit with us for the last five years. I may say that the Wealthy after being blighted killed down to the ground and sprouted up in bush form. They are bearing very profusely; we found it necessary to

prop up the limbs of the Wealthy to keep them from breaking down; they were large apples, fine apples. The Peerless we received from Mr. Brand. It came into bearing last year with two good specimens. We also have the Patten Greening growing, and I can endorse all that has been said about that apple tree. It is without doubt the best and healthiest grower in the orchard. I have also some of Peter Gideon's seedlings, but the only one that has fruited is the August. It does not appear to be of much account. This is briefly a history of the large apples we have grown.

In our locality we grow an abundance of the crab apple, and we are not troubled with the blight as you are down here. We grow some enormous crops of Transcendent; we had nearly thirty bushels from one tree. We sold them by the pail, and we got a dollar a pailful for them, just an ordinary water pail. The other kinds we find very prolific are the Hyslop, Virginia, Montreal Beauty and a variety called the Greening, also the Minnesota crab, which came into bearing for the first time this year. It appears to be quite hardy. That about covers the extent of our apples. We have another fruit from Minnesota known as the Compass Cherry, that bore nice specimens of good fruit. I think it has a future before it in our country. We can grow all the small fruits without any difficulty. I may say one thing, however; Manitoba is a large province, just as the state of Minnesota is of considerable extent. You can grow some things in southern Minnesota that you cannot grow in northern Minnesota. In some localities of Manitoba they have not succeeded in growing the crab apple, and in some localities they have succeeded in growing not only crab apples but some of the larger apples as well.

Early Training of Fruit Trees.—All pruning of the apple should be done the first five years after planting in the orchard, except water sprouts, broken or dead limbs. In starting a young orchard, look after the trees all through the spring and summer, and wherever a limb is found to cross other limbs, it should be cut out. If a tree shows a disposition to grow in a forked shape, select one branch, the nearest in position, to form a main stem. Cut the end off all the other branches, leaving the one intended as the stem or center stalk without cutting, keeping watch on such a tree for two or three seasons afterward, and while in a growing condition nip the terminal buds from the side branches. This will soon give the stem the advantage of the growth and the other limbs will become side branches. This corrects a forked top without injuring the growth.—S. H. L.

THE USE OF DRAIN TILE IN THE GARDEN AND ORCHARD.

R. A. WRIGHT, EXCELSIOR.

Perhaps I can best present to you my ideas about drain tile by stating my experience with it.

When I located on my farm eight years ago, I found it badly cut up with open ditches—one nearly seventy rods long and three cross ditches varying in length from ten to twenty rods each. These ditches were from a foot and a half to three feet deep, and about two feet wide, and were lined the entire length with weeds and bushes, making a very unsightly picture. As will readily be seen, there was much waste land as a result of this system of draining. Besides the actual width of the ditch, there was the usual allowance on either side necessary for turning when plowing and cultivating. My farm was divided and sub-divided, making it very inconvenient to work.

These ditches carried off the surface water but did not drain the soil sufficiently in flat places. I concluded to try tiling, hoping to find a more satisfactory system of draining. Beginning at the lower end of the field, I laid six inch tile, four feet deep, a certain distance, then five inch tile a certain distance, and the remaining thirty rods used four inch tile. I then laid four branches with three inch tile.

All of this tile is three feet or more beneath the surface of the ground except the ends of the branches, or cross tiling, which are from one and a half to two feet deep where they tap the low places.

These low, flat places bothered me for three or four years during wet seasons with heavy rains. The tile did not carry off the water quickly enough to prevent the ground from souring, for in extreme wet weather water stood on the surface of the ground for days at a time. As a result of this imperfect draining, I harvested very little fruit in these localities. Plants would do fairly well until a wet season came, when they would die, so there was no reasonable assurance that fruit would be harvested, and it seldom was.

I tried digging quite a large hole at the end of the tile, filling it with small stones and broken brick. This plan worked nicely for a time, but every spring the mud would cover the stones, preventing the water from seeping through quickly, so that it would stand for days at a time on the surface of the ground.

Four years ago, following a neighbor's suggestion, I sunk a kerosene barrel at the end of each branch, setting the bottom of the barrel about one foot below the tile, and making a hole in the side of the barrel in which to place the end of the tile. I bored a half dozen inch holes near the top of the barrel—at the surface of the ground. Over the barrel, I placed a cover which I weighted down with a

stone. This does the work. I have five of these barrels sunk on the place, and they are a success.

In the place of open ditches, grown up with weeds and bushes, running through the place, and patches of ground here and there where berry plants or apple trees would not grow, I now have *one* field; can drive the length and breadth of it with no hindrance from open ditches; there is no waste land, and plants are growing on all the low places.

Counting the price of tile and the labor of laying, it may seem expensive to some, but I am satisfied with my investment and have been repaid for the time and money spent.

Col. C. L. Watrous (Iowa): The ditching I have done—and I have done some miles of it—has been done with tile, and I would not think of having anything else but tile, and if a man should offer to come on my land and offer to make an open ditch for the water to run, and do it for nothing, I would want that man to keep off. Now, in draining a marsh any amount of water that can be made to run through an open ditch can be made to run through tile if you use tile large enough and enough of them, if the tile are of proper size and placed at proper intervals; they will take the water from any ground anywhere except, I think, Niagara. Any of the sloughs and marshes of this western country can be drained in this way, and, as the gentleman who read the last paper said, with comfort and with profit. I hope that any one who has any land he wishes to drain will consider the matter very seriously before he makes any open ditches.

Mr. R. H. L. Jewett: I would like to inquire whether any of these gentlemen present have found any difficulty in the freezing of tile drains and damming up the water. We have a little place where we have no place of draining it except by an open ditch, but from observations of culverts along the roads I noticed that tile drains freeze up in the spring. What advantage would there be under those circumstances?

Mr. S. D. Richardson: I have had a little experience in tile draining where there was not much fall. I started the ditch and calculated to dig it to water level and put in my tile. There came a rain in the winter, about New Years, and it froze up all my tile, and in the spring I had to dig it all out. The next spring I selected a box 2x3 feet, and as my tile was only two feet underground I calculated when it came freezing weather in winter I would go down there where the box was placed at the outlet and empty the tile and I would have no trouble. I had another piece of ground where the water always stood as soon as there was a little more rain than usual, still it was not so wet the grass would not grow, but I managed to get tile through there two feet deep. I put it right through a slough two feet deep, and in the center of the slough I put down a box about 4x5 feet, and when the water runs through the tile it runs into that box, and since I have done that I have not had any trouble from freezing. A year ago last summer we had about sixteen inches of

rain in four weeks time. I had four inch tile laid, and it was a failure. When you have four inches of water on a level within a few days that size is not sufficient to run it off, but ordinarily that four inch tile will empty the slough in a couple of hours.

Mr. R. A. Wright: In regard to this freezing of the tile. If you have fall enough to carry your water off—and your tile ought to be two and one-half feet deep—there is not much danger of its freezing, but I had trouble with freezing with the end of my drain where it came out of the ground; the tile would stop up for some reason, and it would break out and cause me considerable trouble in the spring. About the third spring I noticed there was trouble within twelve feet of the end of my tile. One tile would be rotten and broken in. I concluded there was frost there and that was the reason it broke. I dug back about sixteen feet and in place of the tile I put in a square box, using twelve inch plank. That was four years ago. I have not had any trouble since with my tile freezing in any place. I have overcome the difficulty in that way.

Col. C. L. Watrous (Iowa): Let your tile go down as far as you can without freezing, then carry it out with wood to the open ditch.

Mr. R. H. L. Jewett: That meets one of the points that has been a question in my mind. The ground freezes, and the melting of the snow produces water while it is freezing.

Mr. R. A. Wright: That is the reason I used the barrel. There are the holes at the surface, and if any water should get in there it would not settle, but would run out of the tile.

Mr. Frank Yahnke: When I was in Germany I was inspector of a farm of five hundred acres. At the opening of the tile drain we always had four to eight feet of open ditch filled with stone, and wherever there was an opening this stone would be covered with straw to prevent freezing, and we never had any trouble with freezing at either end.

Mr. J. W. Murray: I laid a piece of tile to drain a meadow, and some times it froze and kept the water back, but it did not do much harm. I think the ditch should have had a little more slope, and in that way I should have remedied the freezing by not having the water collect in the tile to freeze.

Mr. R. A. Wright: There is another thought that Mr. Jewett suggested. The water does stand around those barrels in the spring when it first thaws, but I have never seen any bad results in consequence. I do not think there will be any trouble where you have hard ground that is frozen solid. I have had no damage done in the spring.

Mr. R. H. L. Jewett: I make those inquiries because I want to get some practical knowledge of the subject. Some apple trees standing near a spring died last spring. We found the bark had peeled off, and we are satisfied it was on account of the water freezing about the base of the tree. Now the question is how to get that water away.

Prof. T. A. Hoverstad: I think some of that water would have been taken away if it had been a tile drain. One winter while I was

in Wisconsin there was a piece of ground near the experiment station that was tile drained. Close by was land that had been manured in the fall. We had some nice warm weather for a few days, the snow began to melt and the water in the tile began to flow and the water that came out of that tile was very much colored from the manure on the surface of the ground, and that made it very evident that there was a percolation through the frozen ground.

MY SCOTCH PINE WINDBREAK.

PAUL P. KLEVANN, STARBUCK.

The Scotch pine windbreak shown in the cut was planted in 1892. The size of the plants when set was between twenty and thirty inches, five year old, and two times transplanted. Many of the trees are now from sixteen to eighteen feet and over high. They have had no cultivation but have been mulched twice with rotten straw, and the weeds have been cut down every summer and left upon the ground as a mulch. The trees are planted six by eight feet apart. This windbreak serves two purposes: it shelters the barnyard against the northwest storms and makes a cozy place for the stock; it protects the orchard on the west of it from the east winds, so destructive to fruit blossoms in the spring.

The Scotch pine is hardy here and seems to be perfectly at home. It transplants easily and when once established will stand any kind of weather.

SCOTCH PINE WINDBREAK.

APPLES BEST ADAPTED TO SOUTHERN MINNESOTA.

WM. SOMERVILLE, VIOLA.

In making this selection I do it from our own orchard of nearly two thousand trees, with more than one hundred varieties. In making a selection of some twelve varieties, taking into consideration the hardiness of wood, the productiveness of fruit, quality for market and home use, I would select the following varieties: Red Duck, as received from the Department at Washington, a red apple of medium size, good quality, ten to fifteen days earlier than Duchess; Glass Green, the best of the Duchess family; Gilbert, my best fall apple; Patten Greening, large and fair quality; Wealthy, fine, needs no comment; Longfield, fruit medium in size, but of good quality; Shylonka, late fall, large red, good quality; Rollin's Prolific, winter, good quality; Brett No. 1, fruit large, fair quality; Anisim, fruit small, good quality, red; Repka Malenka, good keeper, fruit fair; Malinda, the best keeper we have, fruit rather poor but good when other fruit is gone.

In this selection of twelve varieties I do not wish to be understood that these are the only varieties worthy of cultivation. There are a number of the Thompson Seedlings which I believe will do well in the southeastern part of the state. McMahon's White, White Transparent, Hibernal, Okabena and a number of other varieties may be planted and grown successfully in the southern part of the state, and perhaps many other varieties.

APPLES FOR SOUTHERN MINNESOTA.

F. W. CHAPMAN, PLAINVIEW.

I will speak of these varieties in order as they ripen. The early summer apples which succeed well with us are Yellow Transparent and Tetofsky, both Russian varieties. They both ripen at about the same time. The trees are hardy and early bearers and produce a fine quality of fruit.

Late summer and early autumn apples. We always include the Duchess in this list, and we would feel safe to recommend the Longfield and Wealthy. The first named is a Russian variety of recognized merit, a hardy tree, an early bearer and usually carries a fine crop each season. The Wealthy is coming into favor each year, as people become acquainted with it. We hear expressions like these: "It is an elegant apple;" "It is a dandy;" "It is perfectly splendid."

I will now mention three winter varieties, the Hibernal, Northwestern Greening and Malinda, all of which succeed in our locality.

The Hibernal has proved to be a hardy tree and a good bearer of a good quality of fruit. The Northwestern Greening is also a hardy tree. It comes into bearing in from three to four years after transplanting and carries a large apple of fine quality. The Malinda may be classed with the iron-clads. It usually bears every year after coming into bearing, which is from five to seven years. The tree possesses quite a number of good qualities to recommend it: hardiness, great bearing, long keeping and a fair quality of fruit. The three last named varieties may well be placed with the commercial sorts.

There seems to be a growing demand for the Patten Greening. I would say, however, they have not come into bearing in our immediate vicinity as yet. The Peerless has proved to be another exceptionally hardy tree and a fine apple. I believe it is all that is claimed for it.

Mr. C. W. Gardner (Iowa): I have been listening to the valuable paper that has just been read, but I would like to ask Mr. Trigg how he places the Hibernal with the winter apples. I would infer from the paper it was an apple of good quality. If I were to describe the quality of the Hibernal I should use just one word, atrocious. (Laughter.)

Mr. J. S. Trigg (Iowa): I simply read the paper for another man, so it was not my opinion at all. I coincide with all Mr. Gardner says. I would rather raise pumpkins. That apple is a terrible thing.

Mr. W. L. Taylor: On the prairies it is the best thing we have. It is certainly the best cooking apple we have. When my wife wants apples for mince pies, she will have nothing but the Hibernal.

Mr. Triggs: When you have got to mix up all kinds of flavoring with an apple like that for mince pies, you might just as well keep that thing out. (Laughter.)

Mr. A. P. Stevenson (Man.): I am sorry to hear the Hibernal run down so much, because I can assure you it is quite an acquisition with us in the north, whatever it may be in southern Minnesota. It is the most hardy apple we have up there, and we find it keeps with us into February, and to eat it at that time we find it a thoroughly good apple, and I believe equal to a great many others that are grown down here.

Mr. Trigg: My friend lives in Manitoba. If he goes three hundred miles further he will probably find some fellow living out there who thanks the Lord every day for a crab apple because it is the only one he can raise.

Mr. J. S. Harris: The only thing wrong about that paper was that he recommended the Hibernal as a commercial apple. You could not sell it in the city of La Crosse. You could not sell a bushel of Hibernals if there were any good apples in the market.

Mr. Wyman Elliot: I am glad this thing has come up in the way it has. We have northwest of us a country where they can raise

little fruit of any kind, and if the Hibernal will cover that one locality we ought to recommend it, but in recommending anything on the list we want to decide what district it is adapted for, not recommend it for southern Minnesota or northern Iowa, but recommend it especially for Manitoba or any place where it is regarded as a good apple.

Mr. C. F. Gardner: I say the Hibernal is an absolutely hardy tree, free from blight, a good bearer and good fruit for certain purposes.

Mr. C. E. Older: In South Dakota I find they have divided that state into six districts, each one having a different fruit list. Between the Missouri and the Big Sioux they can raise good fruit, but in the northern part of the state it is the other extreme. In the northwestern part of this state they cannot raise anything.

Mr. J. S. Harris: I hope you will not condemn the Hibernal; my wife said if I would only plant enough Hibernal she did not care about the rest.

Prof. N. E. Hansen: The Hibernal will live and bear in the north where they cannot grow anything else. It is an apple for which there is going to be a good field in Manitoba, the northern part of Minnesota, the northern part of South Dakota and North Dakota.

Mr. O. F. Brand: Some sixteen years ago I got myself roundly cursed and abused for telling the truth about the Hibernal apple, and I find now that a good many of those horticulturists have come round to my way of thinking. I had a little discussion at that time with Prof. Budd and Col. Watrous about the Russian apple. I told them it was atrocious, as Col. Watrous said at that time. About its growing in the north: there are other varieties that are so immensely better. Take the little Meader's Winter crab, that will grow further north and give them in the average home all they want, and there will be ninety-nine bushels of that crab raised where one bushel of Hibernal will be raised. It is one of the finest crabs raised, and people will use it in preference to anything else. There are other varieties that are three-fourths apple and one-fourth crab that will grow and produce bushels, will produce five where the Hibernal will produce one.

Mr. F. W. Kimball: The question of apple raising in southern Minnesota is dependent upon whether you want to raise them for the home or for the immediate neighborhood market. If you want to raise it for the home I know of nothing better than the little sweet crab. It is raised at a good many points and makes a good baking apple. Sweet Russet crab it is called. I could recommend to every one to have one or two trees of that variety in the home. Then follows the Yellow Sweet. It is a medium sized apple, of delightful quality, but soon gone. Then comes the Briar Sweet, which is also a delightful apple. If you have children in your home do not fail to have some of the Briar Sweet. They can go out and pick them day after day. If picked and ripened in the cellar or house they are soon gone. Then follows the Duchess, about which it is not necessary to say anything, and then the Whitney, which should

not be neglected. The Wealthy needs no comment from me. Then follows the Minnesota crab. I think it should not be named a crab. I think so highly of the tree that I moved three years ago to have the name "crab" stricken from it. It has not been given the prominence it deserves. I can dispose readily of them at our place. It is a delightful apple that is good in November, and they are a heavy bearer after once started. Then the Peterson's Charlamoff is an apple that should not be neglected. The Longfield is an apple that has the most merit of any apple I have, not in quality altogether, but it is a free bearer, a heavy bearer, and probably as hardy as the Wealthy. I have trees of the Longfield budded in the fall of 1894 (set in the spring of 1895), from which the entire top was eliminated except a few spurs, and a new top was made since the spring of 1895, and this year some have had as much as a barrel of apples. It has not missed a crop of fruit since two years old. The Patten Greening is of large size, a good cooking and a fair eating apple, perfectly hardy and free from blight. I am speaking of these things as they happen on my ground. The Blushed Calville is a delightful apple. An apple probably not much known is the Cresco seedling, an apple that was originated by Mr. Mitchell. It is very hardy, that is, on my grounds. It is what is called the Cresco seedling. It is an apple that looks something like the Blushed Calville, the same color and about the same quality. It is an apple well worth looking up. As to the Yellow Transparent, spoken about in the other paper, I would avoid it as I would any other blighting variety. I only require to know that a tree is a blighter, and I will not grow it. In the place I bought I had growing on the grounds two large Transcendent trees, and I set out quite an orchard of trees in a small way. I found them blighting badly, and knowing that the Transcendent was a blighter I determined to cut them out and see what the effect would be. I had other trees that I considered non-blighters that blighted badly. In the winter of 1895-6 I cut those two trees out, and in an orchard of six hundred trees I have not had a twig of blight since I cut out those Transcendent trees. I believe blight is as contagious as smallpox, and I would just as soon take a smallpox patient into my family as I would a blighting tree into my orchard. I do not believe I am entirely immune from blight; I may have it yet, but I believe I made a great stride toward eliminating blight when I took out those Transcendents. That is the reason I would not plant the Yellow Transparent.

Those are the trees I would recommend for our section. I would recommend those trees for the family orchard. When it comes to the question of an orchard in our section of the country, in which we are looking for commercial apples, I would plant Duchess, Peterson's Charlamoff, Wealthy, Longfield, Patten Greening, and I would put in a few Northwestern Greening, although I do not think we have had sufficient experience yet to say whether they are entirely hardy. I visited Mr. Philips' place in 1897, after the hard winter, and his Northwestern Greening were looking remarkably fine and stood the winter much better than I expected they would. We know what the record of the Malinda is in point of hardiness,

and it is an apple well worth planting to some extent. On its own roots it is a very slow bearer, it comes into bearing very slowly, but top-worked on to other varieties it has proved a very early and quite prolific bearer, and I should recommend for the commercial orchard setting out some Malinda, especially if top-worked. I would recommend each one to top-work that has the tree. I use the Hibernal for top-working; I think it is a great tree for that purpose. Although it is not worthy of propagation in the southern part of Minnesota for the purpose of fruit, it is thoroughly worth propagating for top-working, and I hope to see hundreds of thousands used for that purpose. I have one tree of the Perry growing, but I cannot speak personally of it. I think it is coming into our section of the country and is being recognized as a pretty good apple, but whether I would want to set it for commercial purposes in large quantities is still undecided.

VARIETIES OF APPLES FOR CENTRAL MINNESOTA.

D. F. AKIN, FARMINGTON.

In giving you my views of the varieties of apples best suited for general planting in central Minnesota, I would refer you to the premium list of the State Agricultural Society and to the reports of our horticultural society. As far back as 1866, the first stated meeting of this society, many varieties were recommended that still retain a place in many orchards and must, after the trial of thirty-four years, be admitted to be worthy of general cultivation. I will name a few of the varieties which were recommended by some of the first meetings of this society and give you my experience with them, if the varieties I bought were true to name. Red Astrachan sun scalds easily and blights; not a success on my grounds. Haas: this I consider a good annual bearer, a good market variety worthy of trial; does best top-worked on other stock. Limber Twig: none ever produced fruit for me. Walbridge: every one killed. Fameuse: not a success. Tallman Sweet: bore a little top-worked on wild or native crab. Duchess: hardy and good bearer, but the fruit drops easily. Wealthy: a splendid apple; does best top-worked. Tetofsky: hardy, a slow grower and biennial bearer. Saxton: still is in bearing. And many other varieties only a few of them now being grown in central Minnesota. I have set about eighty of the old named varieties, and out of the lot there are only a few left worthy of being called a tree. Many never lived to blossom, although my grounds and location are considered as good as can be found in this part of the state—a very heavy clay soil and subsoil twenty feet deep, underlaid by limestone rock; a southeast exposure, on an elevation eighty feet above the valley on three sides, northeast,

south and southwest. This high ground trends toward the northwest.

I can only recommend for planting in central Minnesota the varieties of apples which I have in my orchard now living, and this list must necessarily be very incomplete, as there are so many varieties which I have not that may be as good or better than those I have. This refers particularly to the named varieties, as I believe there are many seedlings not named that are better suited for general cultivation in central Minnesota than any now named. I have seedling apple trees that gave me apples from the first of August, 1900, till the first of August, 1901, without cold storage. Some of these trees are from seed planted in 1871, are ten to twelve inches in diameter and lived through the dry seasons that killed most of the poplars and soft maples in the county.

I also have Transcendents which do not kill or blight as badly as that variety has the reputation of doing. One of them has hardly shown any blight, so little that one of my neighbors got some scions from it this year, thinking it is blight proof. Let me tell you about these Transcendents. I bought one hundred of them from J. T. Grimes five and six years old. In setting these trees where they now stand I had the holes dug three and a half feet deep and four feet in diameter and put into each hole three bushels of very fine, nearly decayed chips. I then set the trees in the holes two feet deeper than they grew in the nursery. Every tree lived, and the third year after setting they produced one hundred and fifty dollars worth of apples. They have produced fruit every year since, this year giving from three to four hundred bushels. I have set other apple trees a foot deeper than they grew in the nursery, and believe it a good plan, as the ground at four to six feet deep is not so much affected by the wet and dry weather as at the surface.

What I think would make a hardier tree yet is to plant the seed where the tree is to stand, as the transplanting breaks the tap root and thereby to a great extent prevents the deep rooting so natural and essential to the long life and hardiness of all trees, more especially the apple. Drought never kills deep rooted trees. Consider the oak family. You can find species of it in every latitude, the standard of hardiness, whose tap root is said to extend as far below as its top does above the surface of the earth. Consider the conifers with roots extending sixty to eighty feet below the surface and tops one hundred and fifty to two hundred feet above, with layers showing a thousand years' growth.

Persons who intend setting out apple trees would naturally choose such varieties as would give them fruit in succession during

the year if possible. I will give the varieties in bearing on my grounds in the order of their ripening, viz.: Tetofsky, Duchess, Borovinka, Whitney No. 20, Transcendent, Red Astrachan, Minnesota, Haas, Hebron, Wealthy, Peerless, Virginia, Plumb's Cider, Lieby and Briar Sweet. I have fruited many other varieties, but these named have proved the most hardy.

A few words about setting the tree. Have your trees dug with the tap root entire, if possible; have the holes dug roomy enough to take the roots all in without bending; set one or two of the lower roots straight down; set the tree a foot at least deeper than it grew in the nursery and the same side to the south, and having it marked before digging; fill the hole with dirt above the roots of the tree; then put in water enough to make this new dirt a soft mass, or like mortar; lean the body of the tree to the southwest about ten degrees out of perpendicular; then put on a little dry dirt, say two inches, and tread it enough to work the mortar all solid among the roots; then fill up the hole with dry dirt and pack it again; then mulch within twenty-four hours but not within three or four inches of the body of the tree. This tree will live if properly cared for before setting. Protect the body of the tree from sun scald, mice, rabbits and borers, with screen wire from earth to limb. Kill all pocket gophers with a little strychnine on a piece of an apple, and you have a show for success.

Mr. C. G. Patten (Iowa): I was interested in the gentleman's paper in that he seemed to recommend the Haas and the Plumb Cider. As I understand it, the latitude in which Mr. Akin lives must be about forty-four and one-half degrees. I live in Iowa below your state line, and on the common prairie soil of northern Iowa the Haas and the Plumb's Cider are not worthy to be recommended. The Plumb's Cider on yellow clay soil underlaid with lime rock or a heavy similar soil is considered a success, and the Haas would be a success on the same soil, but neither one of those varieties is to be depended upon. I make this statement in order to present another idea, and that is, I believe in the discussion of these papers we should consider locality of the orchard that is reported, and if I understand correctly Mr. Akin is located upon an elevated site and probably has an especially good soil for the apple. So it would not be safe to recommend the Haas or Plumb's Cider for general planting even on quite favorable soils in central Minnesota; it would not be safe to recommend it in northern Iowa for those kinds of soils.

I will just state an experience along the line of artificial experiments that I have been making with the apple. It was the first large experiment I undertook in cross-fertilizing, and our present pomologist, Major Brackett, was the man who did the work. We secured pollen of the old Talman Sweet and crossed it with the Briar Sweet. I knew the origin of the Briar Sweet, as I happened to live when a

young man near where it originated. This Mr. Briar had the old large Red Siberian and the Bayley Sweet apple, and he planted the seed, and that Briar Sweet was the result. Those of you who see the apple will be apt to notice the general appearance of the leaf of the tree from that cross, and especially when you look at the Briar Sweet apple, and you can readily detect the marked resemblance of the apple with the Bayley cross. Out of eight trees I have from that cross four of them have fruited this year, and every one of those four apples are sweet apples, one of them resembling the Briar Sweet, but one of them resembling the Talman Sweet in color and flavor and the excellent sweetness it has. Many of them are considerably larger than the Briar Sweet.

Mr. J. S. Harris: Tell us something of the University apple.

Mr. Patten: The origin of the University apple is a seedling of the Perry Russet, and the seedling was grown on the university farm in Wisconsin, and the seed came up in 1881. It is a remarkably erect tree. You could travel a long distance, even in forests, to discover anything more erect than that No. 2, or University, apple. It has been a fair bearer and is a good apple of a good and uniform size. I had thought for a long time that it ought to be a valuable apple for a much more northern locality than where I live. Its season is not late, and yet with care I have kept it through January. It is not an apple having a good skin; it is easily bruised and spoils and rots like any fall or early winter fruit, but with care it will keep quite a length of time. It is something like the Wealthy in that regard.

Prof. N. E. Hansen: Have you finished about the Briar Sweet, about the future of the work? What do you expect to do, put more sweet into it or how?

Mr. Patten: It would be difficult to put more sweet into the apple than we have. The only thing I have that is more sweet is a seedling of the Wealthy that is perfectly hardy and sweet.

Mr. O. F. Brand: The remarks of the gentleman from Iowa raises the question of the comparative hardiness of our apple trees we are breeding here. He seems to advise us to be very cautious with the Haas and the Plumb Cider. Now the Haas and the Plumb Cider were in bearing here a great many years prior to 1884, and they were old trees then; in 1882 I picked a barrel of apples from a Plumb Cider. But my Plumb Cider were all killed (I had planted a number of them) in 1884-5. At that time the Patten Greening was not known in this state, did not know that the tree had ever been planted, but the Haas came right on of those that were killed down. The Plumb Cider nearly all killed root and branch, the Haas killed to the ground, others killed to the snow line, and I frequently saw trees at the northern edge of fences where there was protection formed by snow drifts in 1884 that soon came into bearing again, (and I judge them to be hardier than the Patten Greening, and I have good reason for thinking the Haas is hardier than the Patten Greening and is more valuable in southern Minnesota than the Patten Greening, because the Patten Greening has had no test in this state yet). Now in Mr. Akin's paper he stated that there was no better way of getting an orchard than by planting seeds, and I am very

strongly of that opinion myself, for the average farmer cannot do better than to save seeds from Duchess apples and perhaps a few others, but if he can find Duchess growing alone where there is no possible chance for cross-fertilization he will do well to save the seeds from the largest apples which mature and hang on the trees the longest. I have a lot of such seedlings myself that have been in bearing a number of years. An Illinois nurseryman was at my place last summer and stood looking at those trees and he seemed to be quite carried away with them, and he made this remark: "What better way can the average farmer do to secure a good orchard than to take your plan and plant seeds from the Duchess apple?" We have in our county some sweet seedlings. I have among that lot of Duchess seedlings no sweet ones, but Mr. Miller, the originator of the Peerless, has upon his place a tree that has been bearing a good many years. It produces a sweet apple about the size of the Golden Russet and one of the best sweet apples for eating and baking that I have ever tasted. I do not think it came from the seeds of a sweet apple, because he saved seeds from his own orchard at that time, and he had no sweet varieties in bearing. I think we had better go a little slow in recommending trees that have not passed through the winter of 1884-5, except seedlings.

Mr. R. H. L. Jewett: I would like to take your time for a minute or two. It is hardly fair, it seems to me (taking the gentleman who has just spoken at his word), it is hardly fair to condemn the Patten Greening. It is all right for him to praise and recommend the Haas, since it has been tested. I do not know what a test winter is unless last winter or the previous winter were examples. I have fifty of the Patten Greening set in an exposed position, the snow was blown off, no mulch and no special care taken of them, and they came through without the terminal bud being injured, and as handsome as any tree I have ever seen. I am not speaking of the Haas and the Plumb Cider. I could not compare the two, but I am stating what I do know to be so of a certain apple I am acquainted with. An inquiry was made about the University apple. I have some of those trees growing, and every tree made a splendid growth. They have the right kind of limbs, are of a dark color and are strong and vigorous growers. I wish some of these older horticulturists would tell me what a test winter is. I know thousands of trees disappeared last winter.

Mr. A. D. Leach: I want to say a word about the Patten Greening. I have the University, possible the oldest in this part of the state. It was sent me by Mr. Patten eight or nine years ago. The University has kept well with me. It has borne some for three years. It had about a half bushel to a bushel this year and about the same a year ago. It is an apple of medium size, a firm, smooth apple, with very little red, but it colors a little where the sun strikes it; it is mostly yellow and light green, and I consider it, so far as I have had a chance to test it, one of the hardiest trees I have. It is certainly the handsomest tree in my whole orchard.

The Patten Greening I have had about the same time. I got them, I think, the same year with the other trees. They have never

shown any blight, never had a bud killed. I have seven trees of them. They bear finely, and if there is any fault to be found with the Patten Greening it is with the skin of the apple. For the past two years black spots have made their appearance on the skin during the growing season. It commenced the middle of the season. The skin would turn black and begin to rot, and quite a few rotted on my trees this year and also last year before the apple was ripe. All those that did not rot were nice apples, but rather an inferior eating apple. As compared with the Haas—I have Haas that were set in 1881 and were killed in 1884-5 somewhat worse than my Wealthy, but they grew up again, and they are large bearing trees now. They killed very badly two years ago. I cut off the limbs that did not grow, and they bore a good crop of apples this year, but I do not consider the Haas as hardy a tree as the Patten Greening.

Mr. J. S. Parks: I have a few Haas trees, three or four of them, that I think were set in 1874 or '75, and I do not know of their ever losing a bud by being killed by blight or by being winter-killed. I consider them among the hardiest trees growing. In regard to going slow on those trees that are out for trial, I think that is a good idea. I have a tree that is evidently a crab of some kind, although it is a long keeper—I have bragged about that tree as being as hardy as anything there was in Minnesota. The trunk of the tree is upwards of ten inches in diameter, and the top is perhaps twenty feet in diameter and has borne from twenty-five to thirty bushels of apples yearly for a number of years. It was a good bearer, and I supposed it would stand anything. This year it is dead all but one limb on one side of the tree. So I think we should go slow so far as recommending new varieties is concerned. I wish some older member would tell us what a test winter is. I think a test winter is one that kills every tree.

Mr. C. G. Patten (Iowa): I just want to reply for a half minute to what Mr. Brand has said. I presume Mr. Brand would not question a comparison between any other tree and the Duchess of Oldenburg. The Greening sprang up in the spring of 1870, and I had it when those test winters came, and trees of the Duchess of Oldenburg, numbers of them, and I had scores of Haas on my grounds about the same age as the Greening that would be a fair comparison with them. In the winter of 1884-5 in a row of Duchess of Oldenburg twelve to fourteen rods long, three or four of them were killed entirely, and some of the best trees lost a portion of their limbs in those trees. The very best Duchess of Oldenburg I had had spurs killed on them from twelve to eighteen inches long, numbers of them, and I had injured and lost six to one of the Patten Greening. The Haas on my grounds stand on better soil than the Patten Greening. The Greening stand on very severe soil, but the Haas on my grounds have been a perfect wreck ever since that winter. There is no more comparison between the hardiness of the Haas and the Patten Greening than there is between the Jonathan and the Duchess of Oldenburg. I state this most positively. I know that my ground is such that I can test trees fully as well as you can in the latitude of Minneapolis. The Patten Greening, the original tree, is as vigorous as it ever was and nearly as perfect.

Mr. A. P. Stevenson (Man.): As to the comparative merits of the Haas and Patten Greening I cannot say, but as to the Patten Greening itself I would say that I planted the Patten Greening eight or nine years ago in Manitoba. Our location is very favorable, or supposed to be so in Manitoba. I must say that at the present time it is one of the most healthy and vigorous trees growing. We have between three and four hundred trees growing there, and it is one of the most vigorous trees we have. It fruited the past year for the first time. That is all I know about the Patten Greening.

Mr. Patten: I intended to add that probably the specking of the Greening or any other apple that shows evidence of rot can be controlled with the Bordeaux mixture. My large Duchess of Oldenburg orchard had become so affected with that rot that two years previous to the past one I received almost no fruit from it that was perfect, and I sprayed very early with the result that the fruit was almost perfect.

Mr. E. R. Pond: What time did you spray for that disease?

Mr. Patten: I spray before the buds are open, then adding Paris green I spray again immediately after the petals have fallen, then again about ten days or two weeks later.

Potatoes from Seed.—I gather my seed balls in the fall and bury them and plant the rotten mass in the spring. Whenever you are in doubt as to whether the potato stem or vine comes from the seed of a seed ball or from the tuber, just note the roots when digging. Potato vines from seed have a long tap root, but when from a piece of cut potato, the roots grow near the surface and are very branching.—H. M. M.

Use of Dynamite in Tree Planting.—The most practical way to prepare a site for planting fruit or ornamental trees on heavy clay, hard, dry or even wet, soggy soils, is by the use of a small charge of dynamite for each tree. I have practiced this method for a number of years with grand success and at an expense of not to exceed 10c for each tree. I began by shoveling away the earth where the tree is to be planted, from a space 3 to 5 ft. in diameter, and from 10 to 20 in. deep, or until I reach the hardpan or dry, hard earth. In center of this excavation I make a hole about 2 ft. deep, with a crowbar or post auger. At the bottom of this I place a small portion of a stick of dynamite, to which is attached a cap and fuse. I tamp clay in firmly above the dynamite and set off the charge.

The explosion will loosen and shatter the most compact clay bed or dry, hard substance that underlies any soil from 5 to 10 ft. in diameter, the depth of course depending upon the amount of dynamite used. In ordinary cases 2 to 4 oz. is sufficient to make a splendid tree bed. It does not throw the soil completely out, but loosens and mellows it so the roots and the moisture will penetrate to a greater depth.—A. D. Barnes, Wis.

Secretary's Corner.

COMMENDATORY.—"Should be very sorry to cease being a member of so glorious an organization."—F. S.

NOVELTIES.—"Last fall I left one of my Bokara No. 3 peaches unprotected. It has come through the winter without serious injury, only the tips being slightly discolored. I have one Gideon seedling apple that produces double or semi-double flowers. I have been wondering lately if this is an uncommon form."—Henry Dunsmore, Olivia, Minn.

PROTECTION OF ROSE BUSHES FROM INSECTS.—E. E. Rexford in "Gardening" recommends for an insecticide which has proved more satisfactory than Paris green, hellebore or whale oil soap when used on rose bushes common ivory soap in the proportion of half a pound of soap to two pails of water, first shaving the soap and dissolving in a small quantity of hot water. Spray thoroughly twice a week during the insect season.

NURSERY SHIPMENTS FOR MANITOBA.—The governor general of Canada has issued an order permitting the shipment of nursery stock into the Dominion at Winnipeg (and at other points not accessible for Minnesotans), between March 15th and May 15th, and between October 7th and December 7th. When received the stock will be fumigated with hydrocyanic gas. Nothing is said as to the duty, but undoubtedly it remains as heretofore.

SOUTH DAKOTA TO BUILD A PLANT BREEDING HOUSE.—Prof. N. E. Hansen is to be congratulated on having secured an appropriation of $10,000 for the construction of the plant breeding house of which he has spoken a number of times in his articles in this magazine and in talks before the society. This will give him material assistance in his efforts to develop and improve upon the native fruits by cross-breeding, etc. We have an equal interest with the people of South Dakota in the result.

J. S. HARRIS' BEQUEST TO OUR LIBRARY.—The son of the late Mr. Harris writes that his father made a bequest of books to the library of this society. This is in accord with his oft repeated statement that the horticultural society were to have his library when he passed away. This bequest will be placed in a library case by itself suitably inscribed and will be prized not alone for the

intrinsic value of the books but more for the memory of the loved hands that have used them.

THE LAST OF EARTH OF JOHN S. HARRIS.—There is not one of our members but will be deeply pained to hear of the death of our much loved and time honored fellow member, John S. Harris. He was taken down with an attack of the grippe late in January from which he recovered in part, though not sufficiently to overcome a run of typhoid fever, which at the end of three weeks caused his death. He anticipated the possibility of a fatal ending to this sickness and in his methodical and careful way made proper disposal of his various interests in preparation for such a contingency. The end came at 12.30 a. m. on Sunday, March 24th, peacefully and painlessly at the last.

The funeral took place at La Crescent village, in the Presbyterian church, of which he had long been a member. A full attendance of his friends and neighbors was there and followed the remains to its last resting place on a sightly hill about half a mile from the church and the same distance from his home. Here we left all that is mortal of our old and true friend. A number of members of the society from a distance gathered in honor and love of his memory: F. W. Kimball, of Austin; W. S. Widmoyer, of Dresbach; O. M. Lord, Minnesota City; J. M. Underwood, Lake City; Wyman Elliot and A W. Latham, of Minneapolis. On behalf of the society, Mr. Underwood spoke briefly at the church of the life and service of the deceased in connection with its work.

Mr. Harris left an unfinished work of great importance in his experiment orchards and elsewhere, which now falls into the hands of his son, Frank I. Harris, who is quite familiar with it and will be able to give it the needed care. We expect to find in him a worthy successor to so honored a father.

Hybridizing Carnations.—Projecting above the flower, which shows better if the petals are split down, are two horn-like growths. These are the pistils or female organs of the flower. The anthers contain the pollen. In hybridizing, this pollen is removed from one flower and spread upon the pistils of the flower which we wish to bear the seed. This is done by tweezers or a camel's hair brush and in some instances by simply taking the flower and scattering the pollen over the pistils. Soon after the flower begins to wither and the petals close together. This is an indication that fertilization has taken place.

After fertilization has taken place, the seed pod continues its growth for four or five weeks and usually ripens its seed within six to eight weeks after the date of fertilization. After the seeds are ripened they are carefully sown and treated the same as the seeds of any choice greenhouse plant.—C. W. W.

In Loving Memory.

JOHN S. HARRIS

Passed peacefully away, at his home in La Crescent, Minn., Sunday morning, March 24, 1901, after an illness of several weeks. So closes a life of loving service to this society and the cause it cherishes, which were dear to his heart.

"The ripened sheaf is fitly garnered."

Yours Truly
J. S. Harris

THE MINNESOTA
HORTICULTURIST.

VOL. 29. MAY, 1901. No. 5

In Memoriam.

JOHN S. HARRIS,

LA CRESCENT, MINN.

Died March 24, 1901, aged 74 years.

The biographical sketch of Mr. Harris which follows was prepared some nine years since and carefully revised by him before its publication in the 1892 report of this society, and as known to be accurate it is thought best to republish it, with a few slight alterations required by the changed date of publication. It was accompanied, in the volume referred to, by a portrait taken evidently during the prime of his life though at a date not known with exactness to the writer. The portrait accompanying this obituary and appearing as frontispiece of this number was made from the large photograph presented to the society at the winter meeting of 1897 and now hanging in this office. It is a noble portrait of a noble man, and no possession of the society is or can ever be more highly prized. Hanging just over the secretary's desk, it is a constant reminder of that steady adherence to unswerving duty which was one of the most marked characteristics of our departed friend and ever an inspiration to high and useful effort. This picture was taken in December, 1897. The account of the presentation of this and another in which he appears also as a member of a group of "Veterans in Horticulture" is published on page 28, Report of 1898, and in this connection it will be found appropriate and interesting reading.

"John S. Harris was born in Seville, Medina County, Ohio, August 17, 1826. His ancestors were among the founders and de-

fenders of this republic, and his parents, Samuel Harris, of Connecticut, and Mabel Gibbs, of Massachusetts, were among the hardy pioneers who felled the forests of northern Ohio to carve out farms and homes and lay the foundations of the present prosperity of that great state. His father was a thorough and practical farmer, and an enthusiastic pomologist and gardener.

"At a very early age the lad, John S., exhibited a great love for horticulture, and, under his father's instruction and a diligent study of the meager horticultural literature that found its way to western homes in that early day, soon became a skillful propagator of trees and plants, and at the early age of eleven years started and managed a nursery and garden of his own. He remained upon the farm until the death of his father in 1844, when, following the advice of his guardian, he served an apprenticeship to learn the cabinet maker's trade, but during that time improved every opportunity to practice his favorite pursuit.

"In the spring of 1847, he enlisted as a private in Company H, 15th U. S. Infantry, to serve in the war with Mexico; went forward with his regiment, joined Gen. Scott at Pueblo and was with him in the campaign that resulted in the capture of the City of Mexico. After his return from Mexico he remained in Ohio about one year, then took a trip west and, making his headquarters in Walworth county, Wis., spent much time in traveling over Wisconsin, northern Illinois and Iowa, at that time a new and sparsely settled country, making long journeys on foot, often with no companion except a faithful dog and trusty rifle, the object being to recover his health, which had been badly wrecked in the hardships and privations of the Mexican campaign.

"In the summer of 1851 he landed in La Crosse still in poor health and with a cash capital of just one shilling, where, after working at carpentering or anything else that turned up for nearly two years, he engaged in the market gardening business. Finding the sandy soil at La Crosse not reliable for gardening or adapted to fruit culture, in 1856 he removed to La Crescent and started a general gardening, fruit growing and florist business. He planted his first orchard in 1857, and has continued to plant more or less trees every year since, making his place virtually a Minnesota horticultural experiment station in which has been planted for trial every choice American variety of apples of which trees could be procured, together with pears, plums, cherries, grapes and other small fruits. He has been twice, in the winters of 1872-3 and 1884-5, nearly conquered and cleaned out by the elements, but has never surrendered to them.

"He began to attend fairs and exhibit fruit of his own growing in 1864, and has followed it up down to the present time, without a break of a single year. At the state fair held in Rochester in October, 1866, he made the largest exhibit of home grown fruit that had been made in the state, and assisted in the organization of this society, the first name on the roll; he has continued a steadfast and active member. In September, 1868, he was elected vice-president of the society, and in October, 1869, president, and held the office until

January, 1871. He was then made corresponding secretary, holding the office two years, and was then elected secretary for one year, and edited the second volume of transactions. Again from 1881 to 1884, he was president of the society, and has since been a member of the executive committee. In 1875, he was elected a member of the board of managers of the State Agricultural Society, and held the position twelve years.

"His has been an active life. Beginning without any capital, except a knowledge of his business, and the help of a willing and frugal wife, he has created a comfortable home in one of the most beautiful spots in the Mississippi valley, and yet has found time to do much for the advancement of agriculture and horticulture, and has spoken and written much upon these subjects during the last forty years, and for many years of the time the writing and study was done at night after long days of hard toil. His school education was limited to the most common English branches that were taught in the common schools of that day, but he has never ceased to continue to educate himself by reading and studying nature."

Mr. Harris took an honest pride in his record as an exhibitor at the state fair, and his record continued unbroken from the time the above was written until the date of his decease. His exhibits last fall, and, indeed, this is true for many years past, being far in excess of those of any other single exhibitor of fruit at the fair. So largely did he contribute to the success of this department that unless his son shall take up this work where he has laid it down and prove a worthy successor of so worthy a father, as we anticipate, it may require a radical re-adjustment of the arrangements in the hall to provide against this loss.

As a member of this society it is impossible to say too much for the fidelity and untiring zeal he manifested in its service. He has been well titled the "godfather" of the society. A leading spirit in its organization, thirty-five years ago, he has never faltered in his efforts to advance its interests. This unselfish work has been appreciated by his fellow members, and he had the pleasure of knowing this was true for many years. In recognition of the special value of his services he was unanimously elected an honorary life member at the annual meeting in Jan. 1880. He and two others at that meeting were given this honor, Chas. Y. Lacy, the retiring secretary, who had served the society well as secretary for some years without compensation, and the late Col. John H. Stevens. These were the first life members placed upon our roll, except Mrs. Wm. Paist. His official relation to the society is recited in the quotation given above. It remains to be said that he continued to be honored with a position on the executive board of the society till the time of his death, making eighteen years continuous service in that office. As the committee on seedlings and a member of the committee on

nomenclature he occupied places for a long term of years which it will be exceedingly difficult to fill with anything like equal ability and effectiveness. Indeed, in what field was he not of infinite use to this society? We shall sadly miss him in every branch of our work, which he loved so well. The life of the society was in large measure his life, and its reports teem with his thoughtful words and the productions of his facile pen.

As an attendant at the meetings of the society he had a remarkable record, with one unavoidable exception, as far as the writer can learn, never having failed to be present at the annual gatherings of the society since its organization in 1866.

As to what Mr. Harris has done for the pomology of the state we will let his own words speak in a scrap of his penciling that has come into our hands since his death:

"I have spent more than one-half of a reasonable long life and the best years of it in helping to work out the problem of successful pomology for Minnesota. From the first planting made in 1857 which consists of apple, pear, plums and grapes, down to the present time my work has been largely experimental, and I have given every variety a trial that I could get hold of that offered any reasonable hope of succeeding under any conditions, and in that time have planted thousands of trees and hundreds of varieties."

Mr. Harris' name is a household word throughout the northwest with all who have any interest in its horticultural development. His valuable services were recognized beyond the boundaries of our own state and even those of the contiguous states. Few pomologists of the day in this country had a wider a acquaintance, and none are more highly respected and loved for a sturdy honesty, a wise discernment, and a kindly heart.

Other words which should and sometime will be said about the life and work of this lamented one are left by the writer to a more eloquent pen, though no one has it more in heart to write them. This death comes as personal loss to each one who knew him, but to no one outside the immediate family circle more than to the writer. In his memory is found a precious legacy, an inspiration and a hope, and this he is leaving to each of us who still "linger on the shore."

Mr. Harris was married on Dec. 24, 1851, to Miss Melissa J. Clayton, who still survives him, as also four children, Mrs. Emma J. Webster and Mr. Frank I. Harris, of La Crescent, Minn.; Mr. Eugene E. Harris, of Galesville, Wis.; and Mrs. Ida May Robinson, of Money Creek, Minn.

A. W. LATHAM, SEC'Y.

"Were you to ask me who has been the most constant and successful exhibitor of beautiful "object lessons" before the agricultural

societies of the northwest, I should say, after many years of careful survey of the field—John S. Harris.

"Were you to ask me who has done the most efficient hard work for the Minn. State Horticultural Society from its very inception to the present day, I should answer, according to the best of my knowledge that man's name is John S. Harris."

A. W. SIAS.

Harbor View, April 4, 1901.

ANNUAL MEETING, 1901, WESTERN (WINNIPEG) HORTICULTURAL SOCIETY.

T. A. HOVERSTAD, DELEGATE, CROOKSTON.

The annual meeting of the Western Horticultural Society met in the council chamber, City Hall, Winnipeg, March 14, at 2 p. m. The reports of the officers of the previous year were received. This was followed by the election of officers. Nearly all the old officers were re-elected. Prof. S. B. Green, Mr. J. B. Rogers of Newark, N. J., and the writer were elected honorary members. Mr. A. P. Stevenson then read a very carefully prepared paper, reporting the meeting of the Minnesota Horticultural Society, to which he was a delegate at their last convention. The report was very complete and very interesting.

Mr. John Caldwell, of Verden, read a paper on "Tree Planting." His efforts were towards interesting people in growing shelter belts for protection. He recommended varieties and methods of planting. The session was closed with the reading of a paper on "Bee-Keeping." This was written by A. Du Pasquier. Many papers were sent by those who were on the program but unable to attend.

The evening session was opened by a brief address by the writer, followed by a lecture on Small Fruit by J. B. Rogers, of Newark, N. J. His remarks created a great discussion, and it was with difficulty that the president was able to stop it and continue the program.

Alderman Barklay, of Winnipeg, then gave a talk on "Winter Flowering Bulbs." He showed great familiarity with many of the flowering bulbs and gave definite instructions in growing them. Certain varieties were also recommended.

The main address of the meeting was delivered by Prof. S. B. Green. His topic was "Agricultural Education." He gave first a brief sketch of the agricultural schools of Europe. In referring to the American schools of agriculture he dwelt in detail on the "Minnesota plan." He gave a very good idea of the work the school was doing in all its branches and gave many illustrations of the methods

pursued in the course of instruction. His address was received with great enthusiasm, and a vote of thanks was extended to him, and the plan he had presented was most heartily approved.

The Minnesota delegates were received and entertained most royally. The Western Horticultural Association is yet small but has many very enthusiastic members and is doing much good. The society is on a good working basis and in the future its influence will be keenly felt.

MY EXPERIENCE WITH PLUMS.

MARTIN PENNING, SLEEPY EYE.

(Paper read before South Dak. Horticultural Meeting.)

My first experience in grafting in Minnesota was as long ago as 1866, and the scions used I brought with me from Wisconsin. They were the large blue plum, originally from Germany, and we grew them quite successfully in Wisconsin. The first attempt made in the then new state of Minnesota did not result very satisfactorily, although they grew well, bore a few plums and then gave up the ghost. This ended my plum experience for a number of years, and my appetite in that direction was satisfied with the wild plums from the woods which I had dug up and transplanted into my garden. Some of these plums were large and very good.

The first improved plums I planted were the Miners and Wild Goose, in 1872. The Wild Goose bore but once, and the Miner bore for a number of years. These plums ripened rather late for our season, and to me at that time it seemed that we were going to have a good deal of trouble getting a plum that would stand the rigorous climate of Minnesota. Careful study and intelligent application finally overcame this difficulty, in fact, it was overcome very quickly, once the horticulturists set themselves about it and profited by each other's successes and also by each other's failures. Many planted seeds from improved plums, and to the few came the gratification of getting really valuable seedlings, seedlings that have proven both hardy and productive.

I was one of these experimenters, and in 1882 planted seeds of the De Soto, Weaver and a few Miner. From these seeds I got a thousand or more seedlings. These I transplanted two years later and gave each an opportunity to prove its value. Two years later most of them bore fruit, and it was out of this lot that I got the Surprise and a few other real good seedlings. Two years ago I got another good seedling—not yet named—the fruit from which won first premium at the Minnesota State fair. This plum is as large as

either the Stoddard or Hawkeye, as good as either, darker in color, hardy, productive and a good market plum.

There has been great progress made in fruit growing in the northwest in the last ten years, the most noticeable progress being made in the apple. At the last winter meeting of our association I saw many fine seedlings, large, good in quality and late keepers. At the last state fair there were over 3,000 plates of apples and 850 plates of plums. In the plum list there seems to be something over two hundred varieties, many of which are too small to be of any value and no good, consequently, for market. There is no use in such a long list, and the smaller and less valuable varieties should be destroyed root and branch.

In my opinion a farmer should not attempt too much in the way of plum growing but should content himself with the selection of from six to eight good varieties and give them the culture they need. I would recommend as a starter the following: for early plums, the Cheney, Aitken, Odegaard; for medium, Surprise, Wyant; for late plums, Stoddard, De Soto, Comfort. The best four plums for market, the plums that bring the most money, are the Surprise, Wyant, Stoddard and De Soto. These four are reliable bearers, quite large and some of the best market plums. These four are my peeling plums, and for this purpose the fruit should be colored up finely but should not be soft. After peeling plums should be thrown into water to keep them fresh in color. Peeled plums are very fine, in my opinion fully as fine as the very finest peach. For plum butter I would recommend the New Ulm, Cheney and Rollingstone. For canning purposes with the peel on I like the Surprise, and Wyant.

Last summer I sold 146 bushels of plums from my orchard, over one-half of them being for peeling. The demand in the market is for plums of uniform size, large and well colored.

I would recommend that plums be planted in rows, north and south. The rows should be about twelve feet apart with sixteen feet between. We must have room to drive in the orchard in order to spread manure. A plum orchard in bearing should have a dressing of manure every fall. I prefer well-rotted barnyard manure. I also find it essential to mulch plum trees in the fall as well as apple trees. For this purpose I use barnyard manure and then in the spring I spread this mulch and cultivate it in. I prefer clean cultivation for the plum orchard. I also cultivate after each rain as soon as the ground is dry enough to do good work. This keeps the moisture in the ground, prevents evaporation and kills the weeds at the same time.

METHODS OF PLOWING AS A PREPARATION FOR PLANTING FRUITS.

PROF. WM. ROBERTSON, MINN. COLLEGE OF AGRICULTURE.

One method of plowing for planting fruits is not to plow at all but to dig a hole in the sod, set the plant out, and with this assistance leave it to work out its own salvation. Probably more farm fruits have had this kind of preparation than have had any other. I tried it myself some nine years ago, with six apple trees. First, I bought the trees one Saturday afternoon to get rid of a tree agent when we were anxious to get our hay in shape for Sunday. The trees came to a town ten miles away, got a ride out with the mail carrier—the roots exposed through the entire ride—and arrived when the threshers were on hand. They were heeled in for the winter, were banqueted upon by the mice under the snow, and in spring when all other work was done they were consigned to their holes in the sod. Two of these trees—a Whitney No. 20 and an Emperor Alexander—fought a good fight, and today stand as evidence of the fact that some apple trees can succeed even with this method of plowing.

Really, in plowing for planting fruits, we ought to take into consideration the various features that are to affect the life of the plant. We are to remember, too, that this final plowing is to be the last for a longer or shorter series of years at the spot where the plant stands. We plow yearly for the annual crop, and if we make a mistake this year we may correct it next. But not so in plowing for fruit planting, so we had better do our job well now and avoid the discouragements and regrets of after years.

The plant we are to set out is to work over certain elements of the soil into edible combinations and forms. Then it is necessary that this material be at hand in the soil. The plant reaches out by means of an extensive root system to gather this material. The material must be in soluble form and must be brought to these roots by the movement of water in the soil. It requires energy to force this root system through the soil. The action of the plant in working over this material is much affected by the temperature and the air circulation in the soil as well as out of it. The plant when set out has only a small amount of reserve force, which is to help it till it gets established in its new home; so, in transplanting, it should be given an intimate and immediate connection with the soil.

Now, the supply of food material, the movement, abundance and presence of water, the temperature, the air circulation, the ease and evenness of root distribution and the intimacy of immediate root

contact with the soil are all points that may be affected and should be considered in plowing or preparing the soil for planting, as should the destruction of weeds and weed seeds and the prevention of baking, and contracting and straining of delicate roots in clayey soils.

As actual experience goes for more than simple theory, I offer you an account of the preparation of the ground for my own home fruits. The experience is limited but was had with a view to accomplishing desired effects, as mentioned before.

The ground selected was chosen not because of the adaptability of the soil but for the convenience of location. It had a thin, clayey surface soil with a yellow clay subsoil, and this again underlaid with sand. It had been under cultivation for about forty years and had, probably, raised twenty-five crops of wheat, quite a number of oats and a few of corn. But little manure had been added in the time mentioned. To emphasize the condition, I may say that it was probably the poorest piece of ground on the farm for producing a crop of grain, and the general condition of the farm may be understood from the fact that it had been rented for about fifteen years, had had no stock on it for ten years, and the year preceding the entire crop had to be given to induce anybody to work the place.

In the year 1890 this piece was sowed to oats and seeded to clover and timothy. The following spring it was fenced, and some hogs with no rings in the nose were turned in to give it its first plowing as a preparation for the planting of fruit. After having the companionship of the hog for several years, this ground was completely covered with strawy barnyard manure. In the spring of 1897 it was plowed from eight to ten inches deep with an eighteen-inch plow and three horses. On top of the plowing in its rough state went another coat of the strawy manure. Then followed the disc harrow loaded with about one hundred pounds of stone on each side (as we do in preparing a cornfield) and with a man in the middle. This, alternated with the slant-toothed harrow, maybe half-a-dozen times, firmed it and incorporated the straw and manure with the upper three or four inches of surface soil. The ground was then sowed to millet in June, and on this millet another coat of strawy manure was put, and the millet cut off in the fall with a binder, to prevent gathering the manure with the hay. Another plowing in the fall, another light coat of manure in the spring of 1898, and another attempt to disc this in. But we found ourselves in trouble now. The mechanical condition of our ground had changed so that although we went over it several times with disc and slant-toothed harrow, we had to return to the plow and three horses again to work this last dressing into the

ground. Several harrowings followed this plowing, and our ground was ready for planting.

Did this method of plowing pay? Yes. The planting was done in '98. In '99 we ate from that planting some raspberries, blackberries and currants, and *feasted* on strawberries. The past season, the third in the growth of this fruit, we ate four varieties of apples from the orchard, while strawberries, raspberries and currants got to be very common articles. Incidentally, the potatoes, corn, pop-corn and beans grown between the rows of apple-trees have in their increase of yield more than paid all the extra work of preparation. At the end of next season's growth I shall look for some of the trees of this orchard to be as large as those that have been struggling in the grass for eight or nine years.

Have I gone beyond my subject and talked about fertilizer? I can't help that. Plowing must have an object. Is my method the method for you? I don't know. Your case must be settled according to the conditions. I needed humus, a better tilth, deeper soil, a conservation of moisture, a higher temperature, less baking, a ready connection of soil with roots, and I got it by thoroughly incorporating the straw and manure, and plowing to a greater depth. In closing permit me to say that there is no better tool on the farm than the disc-harrow.

Mr. J. S. Trigg, (Iowa): Didn't the gentleman make a mistake in putting in millet? Would it not have been better to have put in clover?

Prof. Robertson: I wanted to use the land next spring, and there was only this short time to prepare it. There was nothing else convenient to put on except the millet, and I followed it up with the straw manure again, and the only thing I was afraid of was that we got in too much material. On my apple trees I got one branch of this year's growth that was five feet ten inches long, and that is growth enough for one year anyway.

Mr. J. P. Andrews: Laying the question of fertilizer aside, I thought the proper time to apply it would be in the fall to loosen the ground so as to give it the benefit of the fall rains and then plow it late before the ground freezes up. It would have a tendency then to loosen up the ground. Of course, fertilizing is best and deep plowing is best if we have a deep soil.

Prof. Robertson: I have only about two inches of soil to plow under at the surface, so if that statement is correct my plowing is wrong.

Mr. S. D. Richardson: Is it not a fact that in many portions of our state subsoiling is all right if you get the manure on and get it stirred in. I have a piece of land on my place where I made a knoll and built a house and dug all of the top soil into the clay surface, and then I went to work and put five inches of well rotted manure on and stirred it in, and that soil is as good as any I have on

the place. Out on the railroad track they threw out the yellow clay, and it is yellow clay still. It has been stirred and cultivated, but it has not been manured.

Mr. Andrews: We treated a piece of soil similar to that last and just loaded the manure on, and after cultivating it it was in very fine shape.

Mr. Frank Yahnke: I believe in deep culture; we have got to do it, and if you were enriching the soil less it would be the same thing as if a man had a horse weighing 1,800 pounds and would feed that horse no more grain than he would an 800 pound horse. That same horse would do more work on the same oats than the 1,800 pound horse could do, but if the 1,800 pound horse got double the oats he could do twice as much work. We can take this lesson to ourselves in this way: if we do not enrich the soil, although we plow it eight to twelve inches deep, we have accomplished nothing, but if we also put on manure we will get better results, no matter what crop we plant, whether fruit or anything else.

Mr. T. T. Batcheller: Would it have been necessary to have gone to all that trouble? Could he not have got the same benefit by turning in hogs?

Prof. Robertson: There is nothing objectionable in the hog feature, except I knew I would not be on the ground where I could attend to it sooner, but by cultivating for about two years the ground was put in the best possible shape, and, although it takes lots of work, at the end of three years the ground will be in fine condition.

Mr. Wyman Elliot: I would like to know what he fed those hogs before they were put on the ground.

Prof. Robertson: They ate the clover that was on that land until that disappeared; then they had the timothy grass that followed; then they were fed corn and milk. There was not a great number, perhaps twenty or such a matter. I expected somebody was going to give me fits about putting on that strawy manure, and I would like to hear somebody go for me about that.

Mr. S. D. Richardson: I would like to ask if well rotted manure would not have given the same results as the strawy manure. I always get the best results from well rotted manure.

Prof. Robertson: That would not do, because we never have any of that kind; it goes out the same year it is made. The second year plowing up the clay, as I did, I think the strawy manure was just the thing to put on to make the mechanical condition of the soil right, and today you would not think that there had ever been any clay in that soil.

Mr. Wyman Elliot: Did I understand you to say that you did not put on a subsoiler?

Prof. Robertson: We put on an 18 inch plow and three horses and made them pull as hard as they could.

Mr. J. S. Trigg (Iowa): How deep did you plow?

Prof. Robertson: We had three horses on the plow and a man on the beam all the time, and we made the plow go down as deep as possible. The discing is the important feature. We went over that ground about twenty times with the disc.

LAYING OUT THE PLUM ORCHARD AND HANDLING THE TREES AND PLANTING.

AUGUST WITTMANN, MERRIAM PARK.

An orchard may be laid out in various ways without diminishing the bearing qualities of the trees, but if one wishes to lay out a good sized orchard it is best to plant the trees in crosswise fashion so that each tree has its proper place. By a nicely laid out orchard the planter shows his skill, and the trees being planted in regular rows makes cultivating the ground more convenient. The laying out of an orchard is a very important matter and should be done right in the first place. It is necessary to have a line and a pole, say fourteen feet long, or so long as one wishes to set the trees apart. The directions of north and south should first be ascertained, and placing at both ends of the first rows a stake or marker, the line should then be drawn east and west and staked off a pole's length apart. I now take the plow and plow the land north and south in narrow pieces, so that each furrow runs directly from one stake to the other. I plow the land deep enough, so that the furrow is deep enough to plant my trees in. I arrange the ground on the proper places where a tree is going to be set to allow lots of room for the roots. Before planting one should always dip the trees in a pool of water and earth prepared for the purpose.

Trees that are obtained from the nursery are generally tall and slender with but few roots. A fine looking tree without regard to roots seeming to be the idea, which I have found to be all wrong. What we need in this climate is a tree with low branches and a good supply of strong, frost proof roots. Trees which have not been forced in growing are, in my opinion, the best orchard trees.

There is apparently a great difference of opinion regarding the depth at which a tree should be planted, some maintaining it should be set from twenty-four to thirty inches in the ground to protect the roots from frost, avoid excessive drought and to get a tree on its own roots. My experience has been that if I plant a tree from eighteen to twenty-four inches in the ground, I have to wait till the tree forms new roots over the old ones, which requires about ten years to get the tree in a good fruit bearing condition, the old roots hardly being able to keep the tree alive. Up to the sixth and seventh year, the tree shows but little life, after which it generally begins to pick up. I have noticed that from the tenth to the sixteenth year these trees bear fruit very sparingly compared with other trees of the same size.

The nearer I plant a tree to the surface, the sooner they come in fruit bearing. If I plant a tree so that the top roots are covered with three or four inches of ground, they will generally bear fruit the

second year after planting. This experiment has taught me that the plum tree finds most of its nourishment in the surface soil and roots best in loose soil. For this reason I am in favor of shallow planting.

Another important matter regarding the handling of young trees is that the roots and branches should be cut back, which should, however, be done before the tree is set in its permanent place, thereby insuring better roots and a stouter tree. A yearling tree should be dug up, the roots and branches trimmed and again set in nursery row; the second year after again slightly cut back, and then set in its permanent place. There is some labor connected with handling the trees in this fashion, but it will well repay us. I know of no plant, shrub or tree that is so thankful for good and kind treatment as a plum tree.

Our native plum in many ways surpasses the imported plum, and we should ascertain the best methods in order that the general run of plums sold on our markets may be of the same size as the beautiful samples exhibited at the state fair. Good plums are very much sought for as an article of food. If we do not make greater efforts to secure a large stock of good trees, they will be very scarce yet for a good many years. The wild plums which twenty years ago flooded the market are gradually disappearing, but our selected kinds do not come in fast enough to take their place. In my opinion, the best stock of good trees is to be secured by raising them from sprouts of our selected seedlings.

It is quite an undertaking for me to discuss this subject, but from my long experience in raising trees from sprouts and on the lines above indicated, I feel satisfied that with the necessary care and attention our plum orchards will be more regular in their bounty, and afford us an ever increasing source of pleasure as well as of profit.

LAYING OUT THE COMMERCIAL SMALL FRUIT FARM AND GENERAL PRINCIPLES INVOLVED.

THOS. E. CASHMAN, OWATONNA.

In treating this subject I find there are a great many principles involved to insure success, and to give a thorough treatise of all would require more time than is allotted to me, so I will begin on the most essential feature, which is the market. We must have a good market to insure success. It must be a city of some size and not already overloaded by producers of fruit. Those selecting locations near a large city must take into consideration the kinds of fruit that have the greatest demand and which pay best for the amount of labor it takes to produce a crop. The quantity of each kind to plant also de-

pends upon the market. I know of some towns in Minnesota where red raspberries readily sold for fifteen cents per quart while in others of equal size they went begging for eight and ten cents the past season—and the same was true of strawberries. While the crop was short on account of drouth a few of our cities were overloaded, while others not thirty miles distant depended on these places for their berries. The last place described would be a good site for a small fruit farm.

The location of the plantation must be the second consideration. I would select a well drained tract of land, varied in slopes and retentive of moisture, but the northeast and southeast slopes seem to be the most preferable. I would prefer to plant strawberries, raspberries, blackberries, grapes, currants and gooseberries on a gentle southeast slope where there is good air drainage, which will generally prevent frosts from nipping the blooms in spring. In a small fruit farm I want a goodly proportion of hardy varieties of commercial apples and a plum orchard of our best native sorts. The apples and plums I should plant on the northeast slope.

From observation I am convinced that in order to bring about best results a neighboring body of water is a fine protection for a small fruit plantation. Such a location seems to favor grapes more than any other fruit. You all know the effect a body of water has on the surrounding country. The past season has demonstrated that in order to insure success one year with another an irrigation plant is a very essential addition to a small fruit farm. If near a body of water, as I have mentioned, I would use a gasoline engine to pump the water from the lake or river, as the case may be; and if we should not have this favored location I would put in a deep well and force the water into an elevated tank by means of a good strong windmill or a gasoline engine and irrigate through pipes from the tank. This tank should be on the highest point of the farm.

After selecting the location you must set to work and prepare the soil. It cannot be too rich if properly cultivated. The most desirable land seems to be where it has been seeded to clover for a few years, and on such a piece one year's preparation will suffice. After cutting the first crop of clover, which is generally done the last of June, cover heavily with well rotted manure, plow at least twelve inches deep, not later than September 1st; then get after it with a disc harrow, and drag until it is thoroughly pulverized. Plowing and discing thus early in the season will give the roots of clover and the manure plenty of time to decompose, and the land is solid and well settled for business the following spring. I find that late fall plowing or spring plowing does not prepare the ground properly for

the planting of trees or plants of any kind. It leaves the ground loose, and it will dry out too early, while if the land is plowed early the previous summer and if plenty of cultivation is given the plants will hold their own for at least two months without rain.

I will state here that in spite of the long drouth in the vicinity of Owatonna I did not lose more than five per cent of my apple grafts and about ten per cent of four to six inch evergreens, and I have a perfect stand of strawberry plants all set last spring. I attribute this to the land being plowed very early and well harrowed last season. I planted as soon as the ground worked nicely and then began cultivating and hoeing, which I kept up constantly until the rains came about July 7th, the first we had of any consequence at Owatonna dating back to April 17th.

In laying out the ground I would run all my rows north and south for protection, as each plant receives an equal amount of the sun's rays on three sides of the bush, unless very thick on all sides, which insures an even ripening of fruit. I would have a driveway running directly through the center of the piece with a cross road the other way and the packing shed in the center or to one side of where the roads cross, arranged so that one foreman, unless it were a very large plantation, could keep tab on the pickers and at the same time look after the packing and shipping of the berries.

Next to consider would be selection of varieties and the distance of planting. I will begin with our smallest plant and what I consider our most profitable plant, the strawberry. I would plant Bederwood, Warfield, Splendid, Lovett, Enhance and Parker Earle; but largely of Bederwood and Warfield, and arrange so that the Warfield would be near enough to the Bederwood to insure pollination. I would not plant Parker Earle except on low ground where water will not lodge for any length of time in the spring, and will say that on very rich low ground the Parker Earle is a world beater, but it has got to have abundant moisture.

To get best results out of ground planted to apple trees I would plant my trees 16 feet apart in rows and 30 feet between rows, and in the 30 feet spaces, which, by the way, are running north and south, I would plant one-half the ground to Bederwood and Warfield strawberries and the other half to Enhance. I have stated that my apples would be planted on the northeast slope. Now by planting these strawberries on the northeast exposure it would make a difference of at least three to four days in the ripening of such varieties as Bederwood and Warfield, while the Enhance, which is a much later berry than the others mentioned, would prolong the strawberry season at least one week. In the rows of these apple trees I would plant cur-

rant bushes; first, to utilize the ground; second, to protect the body of the tree from the direct rays of the sun and prevent sunscald; third, to hold snow around the trees in winter to prevent thawing—and under these conditions the plants and trees should receive a good coat of fertilizer each year to keep them strong and vigorous. I would use my irrigation plant towards furnishing the trees sufficient moisture to keep them in good condition, providing it be a dry season and after getting the ground well saturated with water. About Nov. 15th I would begin hauling manure around my apple trees and put around them a sufficient quantity to keep the ground from thawing out in the winter and prevent freezing too hard, also to keep the trees from starting too early in the spring. The bulk of this manure may be taken off or spread away from the tree about May 1st.

Strawberries should be planted fifteen inches apart in rows and four feet between rows.

Of red raspberries I would plant largely of Loudon. They are a very large, fine, bright crimson berry and are also very hardy and productive. Of other varieties I would plant Turner, Marlborough and Columbia. I will say that the Columbia is quite tender and needs more protection than the others mentioned, but if well covered with dirt each winter will give the best of satisfaction.

Of black caps I would plant the Older, which is a good, low bush plant producing good fruit abundantly. The Hilburn is another good black cap; it grows a much larger cane than the Older and is considered a more profitable variety by some. I would recommend planting, first, three rows of both black and red raspberries three foot apart in the rows and six feet apart between them and leave a space of ten feet for a driveway. To insure success each year in Minnesota raspberries of all varieties, except Loudon and Turner, should be covered each winter with dirt, and in very severe locations I would recommend that the Loudon and Turner be covered also.

Of the blackberries I would plant the Snyder and Ancient Briton, three feet apart in rows and the rows arranged the same as for raspberries, allowing a driveway in every third space. Blackberries should be planted on low, well drained land; if they do not have plenty of moisture in fruiting they are liable to dry up. If planted on high land the irrigation plant will be of great value.

On the highest point I would plant at least a small vineyard of such varieties as Worden, Concord, Agawam and Moore's Diamond—and right here will mention a variety that is little known but has come under my observation quite often in our locality. It was originated by Mr. Geo. L. Wolford, of Medford, Minn. He calls it the "Medford Prolific." It is a cross between the Muscatine and

the Delaware, a dark red grape fully two weeks earlier than Concord, about the size of Agawam and as fine a flavored grape as I ever tasted. Mr. Wolford claims this variety as superior to any other red grape and hardier than any black for Minnesota. From what I have seen of it I am convinced that this grape is all that he claims for it, and would want a goodly number of this variety in a commercial small fruit farm. I would plant my grapes eight feet apart in rows and ten feet between rows.

I would not consider this small fruit farm complete without a good patch of currants and gooseberries. Of currants I would plant Victoria, Red Dutch, Long Bunch Holland and White Grape. Of gooseberries I would plant Houghton and Downing, and on the west and north side of my ground I would plant a hedge of the buffalo berry, planting one out of five to male plants to insure a crop. Buffalo berries, if planted three feet apart, will make a perfect hedge and a very good fence as well, and while making a good fence will produce a very nice crop of fruit.

LAYING OUT AND PLANTING THE STRAWBERRY FIELD.

A. W. KRAYS, ELK RIVER.

Although the strawberry crop is very uncertain in this section of the state, we have never been without some fruit since we commenced to grow strawberries—the Jenkins is sure to bear when all else fail.

I select a piece of level land that will not be affected by drouth and manure heavily with well rotted, heavy manure. I plow deep, and if the land is clay I subsoil. I plant to turnips, beets, carrots or squash. I am very particular to not let a weed go to seed. After the crop is removed I again manure heavily with well rotted dressing and plow down for winter. In the spring I work well with an Acme pulverizer as soon as the soil is in good condition to work; I use a number 14 wire line to set the plants, which should be in rows four and five feet apart and fifteen to eighteen inches apart in the rows.

I use a spade or spading fork to set the plants. I commence planting about the first or tenth of May if the soil is moist enough. I press the soil firmly about the roots, taking care to not get the plants too deep or have the roots above the level of the surface; as soon as the plants are set I rake around the plants with a fine tooth rake to bring the moisture to the surface.

In a week I go over the beds and reset all that have failed or are weak; I rake after every rain or once a week for several weeks;

I do not let a weed go to seed. I do all the raking with a horse. When the plants begin to run I use a small tooth cultivator that will throw a little dirt on the plants; they will root better. Each time I work a little farther away from the row, and by fall I have a well matted row two feet wide. Strawy horse manure makes a good mulch put on when the ground first freezes. I never use heavy manure, as it will smother the plants.

It is a good plan to plant the kinds that do the best in your locality. Some kinds do well everywhere, and others are very particular about the location. I am very particular about the plants I use for setting; I use good, strong, well rooted plants. It is hard to get good plants of some kinds, like the Lovett, but only the best are used. The plants must be uncovered in the spring as soon as they start to grow.

PREPARATION AND CARE OF THE SOIL IN THE STRAWBERRY FIELD.

GEO. W. STRAND, TAYLOR'S FALLS.

Land that has been prepared in the best possible manner for the planting of corn is none too good for the strawberry bed, for, as berry growers, you will agree with me in the statement that the proper preparation and care of the soil, with good plants, is the chief factor in the production of a good and profitable crop.

No matter what kind of soil you wish to use for the strawberry field, it will be best to plow as early in the fall as possible, following soon after with the harrow. This will induce a large number of the weed seeds to germinate, and if gone over a few more times at intervals of a few days the greater part of those in the surface soil will have germinated and been killed. As early in the spring as the ground is fit to work, harrow up thoroughly and before planting go over it again, leaving it as smooth as possible.

This soil now should be reasonably clean of weeds, and a great amount of weed killing that would be necessary otherwise has been done away with—providing you do not put in a cultivator and man that will root down into the soil too deeply and turn up a new supply from below. For this reason, and others also, the harrow tooth cultivator is the best to use from that time on.

In planting a spade is about the best implement for opening. One man follows, setting the plants and firming with the foot. This is a rapid method and gives good results even with ground as dry as it was this season.

The cultivator should be started as soon after planting as possible and kept at it at least once every week through the entire growing season. In case of rain it is best to get on to the ground as soon after as the soil permits. The necessity of a compact soil, well cultivated on the surface, for the conservation of moisture, is a lesson that was impressed upon many of us by the past season.

The aim is to cultivate as close as possible to the plants or newly set runners and by going the same way each time keep the runners pushed in in one direction.

Before the runners have set, it will probably be necessary to go over them one or more times with the hand weeder, depending on how weedy the land was and how well the work of preparation was attended to. For this purpose the Lang weeder commends itself, and no person doing any gardening should be without one. It costs but a few cents and pays for itself in a few hours' work. What weeds show themselves after the runners have set will have to be pulled by hand and not allowed to go to seed.

Among the newer implements that promise to be of value in this connection the Hallock weeder comes highly recommended by those who have used it or seen it at work.

There is also a new form of cultivator having hoes instead of teeth, which in most sections is bound to be a desirable implement for the thoughtful planter. The weeds get too much of a start at times to clean out with the harrow tooth cultivator, and it is then that this implement is needed, and a clean job is assured without the necessity of deeper cultivation.

To the berry grower this matter of soil preparation and care thereof cannot receive too much attention, as the lessened expense of bringing a patch into bearing is one of the best openings for increasing profits.

A PLEA FOR OUR TREES.

PROF. MARIA L. SANFORD, UNIVERSITY OF MINNESOTA.

(A Talk.)

I am very glad of the privilege to speak before a society that has done as much as this one in making beautiful and making comfortable our homes and our cities, and before I begin to speak on this special topic I wish to talk upon I want to say one word, if I may, in regard to this very interesting subject that we have had before us, and that one word is that it pays. When you have in your good work such a motive as this you have great hope of getting on—and in your effort to enlighten and educate the people if you will only set before them the picture of two towns or two villages such as I saw in a journey through Pennsylvania recently, one of them the

most God-forsaken looking place I ever set eyes upon, pigs and cattle running in the street, everything down at the heel and wretched looking! After a half or three-quarters of an hour's ride we came to another town. It was a very beautiful place, the houses painted, the streets clean, the lawns green and planted with trees, everything showing thrift and energy. Now, if you can set before the people a picture of two towns like that, which one will they be most likely to select for a home? If you were looking for a place to buy as a home, if the lots were of the same size and the places were equally adapted to your business, which would you pay the most for? Every man that has sense, and especially every woman, every father and mother who have children know they would pay a great deal more for a home in a beautiful town—and what is true of you is true of everybody else. If you will only make your towns and villages beautiful, you will add to the value of every house and lot in the village and secure the best class of people. (Applause.) This is a hard fact, and you want to get it in the minds of your people, and they will go to work and clean up.

It is just in the same line to speak of the forest reserve and talk about the beauty of the trees and their value. I shall not speak of the fruit trees, although I am so fond of apples that I could almost say I am like the boy Beecher spoke of, that he could eat a hatful of apples, but I am always glad to see a big dish full. I cannot speak along that line, but what I can speak of is of the country and village home, the planting of trees and shrubs and the pleasures of fruit growing. But the line I want to talk about is the trees for beauty. I think we all realize the value of the treasure we have here in our pine forest. It was a grand possession until we became usurpers, until the thought came to the mind, "Cut it down," and we now have to cultivate that spirit that says, "Let it stand." There are places in the United States where a tree has rights, rights that must be respected. When it becomes decrepit or dangerous a placard is put on that tree stating that it is the intention to cut down that tree, and if anybody has any objection to offer to be present at such and such a place. It is just that I want to impress upon you, that thought that the trees of our state have rights, and I should like to say that trees have rights that are only a source of pleasure. Every spot where a tree ought to grow, if a tree is planted there, will be the means of making the world more beautiful, and when you have made beauty, as Beecher says, you have the best thing God ever made.

In the first place, for the trees that are now standing in our forests that are so rapidly diminishing, that beautiful park country that we women have tried so hard to preserve, I should like to beg of you, each and all, to throw your influence energetically in favor of the preservation of that park. I am afraid the lumberman's ax is already laid at the root of the tree. I am afraid we shall lose that beautiful tract of timber, and before it is too late we should do all that lies within our power to preserve that beautiful forest for those that come after us. When we think of the tens of thousands occupying this country and the hundreds of thousands who will occupy it,

we should want a place of beauty where, when we have opportunity to go away from home, we can go and hold quiet communion with God and nature. Now let us preserve such a place in the northern portion of Minnesota, that is just fitted for this purpose of a park, and before it has been cut over, before it calls for a greater outlay to preserve the forest, let us make it possible to have a forest there for a hundred years when we are all sleeping in our graves that shall be a source of joy and delight. It seems to me there is unanimity of sentiment that something ought to be done so that when we are gone we may leave a rich heritage to those that we have loved.

To come back to the practical side of this question, I want to say what I said of village improvement, it pays. Those waste lands up north, those unsightly cut-over tracts, the desolate appearance of the country that makes the heart sick to ride through—all this could be made to bring in a good return; and what we want to impress upon the minds of the people so that the project can be carried out is the fact that it is feasible and practicable to establish scientific forestry, so that instead of taking the land and fitting it for the raising of crops we should raise there a splendid crop of trees and that we should preserve those trees, giving employment to hundreds of men, the same as employment is given in scientific forestry in Germany, France and other countries of Europe. In France, where this scientific forestry was inaugurated only fifty or seventy-five years ago, there are forests now that are a large source of revenue. They plant them and care for them, and when they are grown they cut them. This is what we are working for, and we want to preserve the forest that is already there.

I could talk on this subject all night, but I must not say any more on that point except to urge you to inform yourselves on the subject through the report that our able fire warden has recently sent out. We want it done.

I want in turn to urge you to plant trees around your towns and villages. The straight line is not the most æsthetic style of planting trees, but if you plant straight lines of trees on your streets about your towns and villages in Minnesota my mind dwells with delight of what may come as the result in future years. We could have stretching out from our farms beautiful lines of trees, reaching their tops together, so that the young children going to school would not have to walk in the blistering sun, but could walk under the elm or the oak or the pine, so that their æsthetic nature could be cultivated and their lower nature made comfortable by this delightful shade of these avenues of trees. This is a picture, it is true, but it is not an improbable thing; it is a thing that every one of us can help to bring about. This is what I want to ask you to do, to implant in the mind of every child that you have—and if you have no child take some neighbor's child—the idea that he is going to have for himself or herself a tree planted every year of his life, and when he comes to have children of his own that he will plant a tree every year for every child until that child is old enough to plant for himself. If this could be started and the trees were taken care of until able to take care of themselves what a wonderful thing it would be! If the

children could be instructed in tree planting they would be more willing to do it. A great many people are willing to plant trees, but they do not know how. I once thought I would set out trees, and so I had a little hole dug in the sand and put in a little bit of good earth around the tree and expected the tree to grow, but I found after a while that if anything was expected to go through our dry Minnesota summers you must give it plenty of good, rich earth. When you have planted and loved the tree for the love you bear your boy or girl, you will not find it hard to plant for each child a tree, and as the children grow up to love the trees they will not find it hard to plant more trees, and when they grow to manhood and womanhood they will realize that what they did was not done for themselves only but for the benefit of humanity, that they have done something to make the world more beautiful and better, and the child that does that will be a better citizen, a more loyal patriot and a more unselfish man or woman because of this lesson he has received. I want to urge you to take care of the trees, to plant trees, to make our state of Minnesota beautiful in all respects. (Applause.)

GROWING TREES IN AND FOR THE WINDBREAK.

ALFRED TERRY, SLAYTON.

I would most emphatically advise the plants for a windbreak to be bought from one of the large forest tree nurserymen, who are able to raise and deliver to any part of Minnesota forest trees ranging from twelve to twenty-four inches high, at a cost of about one-fourth the expense it would take to grow the same trees yourself.

To make a perfect windbreak the first thing necessary is that the planter should think sufficiently of the *great need* of a grove that will *actually break the wind,* so that he will be encouraged to deviate from the usual course now practiced of planting only one kind of tree in the grove. I visited a farm a few days ago with a large grove consisting wholly of cottonwoods and, with their slim trunks, ight colored bark and few low down branches, it looked about the bleakest thing in the way of a windbreak that I had ever seen. While I should plant in the middle of the grove such branchy trees as the soft maple, box elder, elm, hackberry, etc., I prefer for the two or three outside rows to plant such as European larch or Scotch pine, with an outside border of shrubs, such as lilac, syringa or the like. In this way we make our artificial groves more like the natural ones, and the lilac and syringa holding their leaves until very late in the year, and being about the first in the spring to open their buds, will give the whole grove a handsome appearance, as well as better break the wind. I know that many may be afraid of the expense of these flowering shrubs, but if they were to order of their nurserymen small flowering shrubs by the hundred, instead of by ones and

twos, I have no doubt that they would find the price very little more than that of forest trees. If they will not purchase the shrubs, then I should advise them to use deciduous trees on the outside of the grove and leave these rows untrimmed. If the farmers of our prairies were to deal strictly with the nurserymen and our forest tree men they would find that the planting of a, say, three or four acre shelter grove on the north and west sides of their farm buildings would not cost them the first year over $20.00 or $25.00 all told. By taking my advice in planting many sorts, they will find that the trees themselves grow thicker and better and give a more natural appearance to the whole grove. For appearance's sake do not put a cottonwood in with other trees, because they grow so much faster and taller than the trees that I have named that it will give a dwarfish appearance to the rest of the grove, and also because a cottonwood tree's roots spread to the detriment of almost every other kind of tree.

After having planted your trees, say, four feet apart in the row and rows eight feet apart, be liberal with your cultivation. Trees will return a dividend for a dust blanket as much as corn will. Beginning this cultivation each year early in the spring, cultivate four times and finish early in July. The following fall prune your young trees (with the exception of coniferous trees and shrubs) to one trunk, and continue this annually as long as the tree roots do not make the cultivation too heavy upon your horses. Four years from planting you will have a good windbreak for your yards. The fall of the year is the time for trimming and not in the spring, when it will cause trees to bleed. I would plant three or four trees of a kind together and then three or four trees of another kind next to them in a row, so that when you begin to thin out you will always be able to leave the same proportion of each kind as when first planted. Protect your trees with proper fencing, just the same as you would your orchard.

The few words of advice herein are given from a thirty years' experience in planting groves upon the open prairie country of southwest Minnesota.

The forest aids the fruit grower in two ways: First, it prevents the severe sweep of winds breaking trees and creating sudden atmospheric changes; second, it conserves and balances atmospheric moisture. The sweep of winds when undisturbed bears away the moisture from the soil and also from the trees and their buds. It is well known that fruit buds will endure two or three degrees severer freezing when the air is moist than when it is dry.—E. P. P.

WALKER'S SEEDLING APPLE.

The accompanying cut shows, alongside a Duchess tree for comparison, a seedling apple originated on the place of Mr. J. C. Walker, of Rose Creek, Minn. The tree is now sixteen years old, while the Duchess (in front of which his little grandson is standing in the picture) is about twenty-eight years old. The tree has been bearing since its sixth year and produces a fruit of medium size, of rich red blush color. Its quality the originator describes as "fair

J. C. Walker, Rose Creek, Minn., and his seedling apple tree.

to good." The tree is productive, the fruit hanging well on the tree till ripe enough to gather (about Sept. 15th); of excellent quality. The tree "is as hardy as the Duchess and more productive, and when loaded with fruit is not liable to breaking of limbs, as the wood is tougher than that of other trees; in fact, it is the most profitable of all." Mr. Walker shows a commendably liberal spirit in the distribution of cions from this tree, which he considers of much value. In his own words "when I have a good thing I want some one to share it with me."

THE DUCHESS ORCHARD.

E. H. S. DARTT, OWATONNA.

The Duchess orchard is now of no commercial value unless it is within easy reach of a good market without shipment, or unless nearby cold storage is available. Sometimes the shipper realizes a profit, but on an average he ships Duchess at a loss. It will often pay to change over such an orchard to Wealthy or Peter or other valuable long-keeping varieties by top-grafting. This will require considerable labor, depending largely upon the size of the trees to be grafted. If trees are large, grafting must be done farther out on the limbs, and many limbs must be grafted on each tree to maintain a well balanced top. This work is usually delayed till it is warm enough in the spring so that wax will work readily, which crowds the work into a short space of time and a very busy season of the year. I am working over a large orchard in this way and have invented a wax warmer (not patented) which enables me to do the work in March or April, and I incline to the opinion that it might be done in late fall or midwinter just as well. Take a short length of stovepipe, put on a broad flat bottom so that the thing will stand up, put in a door near the bottom to admit a good sized kerosene lamp, fit a tin or iron vessel in the top to hold the wax to be melted. We graft a tree or two, then melt wax and apply with a small brush. After the weather warms up all should be gone over carefully to see that the wax covering remains in perfect condition.

GINSENG CULTURE.

H. SIMMONS, HOWARD LAKE.

The mystery of growing ginseng by artificial means has been revealed for some time, and, in fact, it is not at all difficult but, on the contrary, is quite easy and pleasant as well as highly profitable. In this connection I wish to quote the Botanist in his letter of transmittal of report to the U. S. Department of Agriculture.

He says: "The report brings out the facts that the wholesale price of ginseng has steadily increased from 52 cents per pound in 1858 to somewhat more than $3.00 per pound in 1893, and that the value of the export for the past decade has amounted to between $600,000 and $1,000,000 per year. The report also points out the fact that the natural supply is now rapidly decreasing, and that its extermination, if present conditions continue, is inevitable in a very short time. At the same time there can be no doubt but that the cultivation of ginseng is entirely practicable." This report was

made in 1894, and since that time enough has been achieved in various parts of America to fully demonstrate the truth of the Botantist's statement in regard to the practicability of its cultivation.

I have had ample opportunities to study the conditions found to exist where the plant grows wild and have grown it for several years very successfully. It takes from three to five years to grow roots large enough for market from the seed—roots that are two or three years old will bring from two to three cents each when dried for market—and one acre will produce from 750,000 to 1,000,000 roots. Can any one show better results from an acre of ground in the same length of time?

While the root is the principal source of income from the plant, the seed is in great demand for the purpose of planting and forms an incidental source of profit. Ginseng produces seed quite freely. An ounce contains about 500 seeds.

The wild root this spring (1901) is worth $5.05 per pound, while the cultivated root is from $7.50 to $10.00 per pound.

SUBSOILING AS A PREPARATION FOR FRUIT CULTURE.

FRANK YAHNKE, WINONA.

My experience in subsoiling for fruit culture is limited, but I have had some experience in subsoiling for root crops. The principles in the preparation of the soil for fruit culture are much the same as in root crops.

The preparation of soil for fruit culture is a very important factor to success, so I will give you a few general principles for guidance in this matter.

The purpose of subsoiling is to retain more moisture in the soil, or to obtain a deeper surface soil.

Subsoiling is not necessary in light, porous, sandy soils, and may be injurious where the subsoil is gravelly. It is not beneficial in heavy, wet soils, unless they are previously thoroughly underdrained; also I would not recommend it on steep side hills.

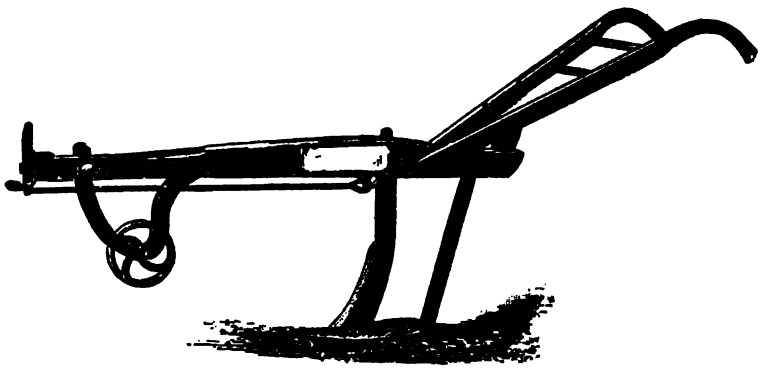
Subsoiling, when properly done, consists merely in breaking up the subsoil without bringing it to the surface or in any way incorporating it with the upper layer of the soil. The ideal subsoiler consists merely of a tongue, as shown in this cut. The subsoiler usually follows an ordinary plow, but the plow should only cut small furrows, or else the subsoiler would leave a strip between each furrow unstirred. The subsoiler should be run at as great a depth as possible. It is often advisable by this means to break up a hardpan

formed by long continued plowing at a uniform depth or existing as a natural formation below the surface.

Subsoiling is beneficial for fruit culture in any soil of medium or of heavy texture, especially where the rainfall occurs in heavy and infrequent showers and when it is necessary to increase the capacity of the soil to absorb water readily and rapidly.

The best time to subsoil for fruit culture is in the late autumn, and the soil should be left in rough furrows over winter, as it will decay in the winter through the action of the frost. However, if subsoiling is left till the spring, it should be done early enough to insure to the soil a thorough soaking with rain before planting, otherwise it may injure rather than improve the soil condition for the first year. Subsoiling by stirring the land to an unusual depth favors the drying out of the soil, so that if it is not supplemented by a soaking rain before the fruit is planted the ground is drier than if the work had not been done.

Where subsoiling is intelligently carried on it will increase the water-holding capacity of the soil and serve as a protection against



A Subsoil Plow.

drought, which has doubtless a very important effect upon the fruit crops, and often means the difference between profit and loss to the fruit grower.

A piece of land that has to be prepared for fruit culture which has previously only been shallow plowed, cannot be at once plowed to the desired depth without turning too much of the subsoil onto the surface, and subsoiling can be done to obtain the desired depth without turning the subsoil to the surface, but the land has to be enriched by manure a season before. For nursery stock, subsoiling is very beneficial, as the subsoiled land will keep from five to ten per cent more moisture during June, July and August, when the young trees need moisture the most.

The virgin soil of this state is comparatively rich in the elements of plant food. In this we are fortunate.

Experience, however, has taught us that plants, shrubs and trees may suffer during periods of severe drought; sometimes they are killed; not infrequently the top of the tree is killed, while the trunk and lower limbs survive. When the drought period is past there are seen trees with dead tops and green lower limbs, forming what is sometimes called "stag head" or "dry top."

These dead top trees are found where the soil and subsoil are compact, not permitting the rain water to penetrate the soil, or where rock, impervious clay or hardpan formation is near the surface. They are found also on low ground where the surface soil is for long periods of time saturated with water to the exclusion of aeration, and when evaporation takes place the trees suffer.

Both air and moisture are essential to plant life; a deficiency of either works injury if not death.

How then can be best furnished to plant or tree that which is essential for the best culture and development, is the question that should receive our earnest and careful consideration.

In cases where the injury results from imperfect root action owing to soil conditions, it may be improved by drainage, by cultivation and in other ways by which more air and moisture are given to the roots. If the soil is too dry, as is often the case, its water-holding capacity may be improved by proper cultivation. If the soil is well dried out when winter sets in, injury is likely to occur by the evaporation caused by severe freezing.

Tender rootlets do not easily penetrate compact lumpy soil.

The advantage, therefore, of subsoiling for fruit culture is in thoroughly pulverizing the ground, so that, like a sponge, it will absorb both moisture and air in times of plenty and give it back, through capillary attraction, in the periods of drought. It also permits the roots of the trees to penetrate the soil to a greater depth, and for this reason they are less liable to be root-killed during the severe test winters.

Mr. Oliver Gibbs: The best subsoiler I ever had on my farm was the pocket gopher. I think we can all learn something from his methods, and it is true what Gov. Pillsbury said to Prof. Porter, "He wants considerable room to work out his plans, but he does it thoroughly." The only orchard I ever planted that was a success from the start and remained alive for years and years after planting, was one in which the ground had been prepared by that little friend of the farmer. In our wells we find another similar lesson. In the mixture of the drillings thrown out from two deep wells on my own farm—wells that were one hundred and fifty feet deep—in

those mixtures after being exposed to the weather for a few years, I raised melons that were very satisfactory to the boys of my neighborhood. (Laughter.)

The President: The objection I have to the pocket gopher is, that he does not discriminate sufficiently; he seems to choose my apple trees and works more upon them than he does at the business of subsoiling. In the last two winters he has taken about twenty good trees three inches in diameter. The first I noticed they were leaning over a little, and the next day a little more, and upon making an examination I found the pocket gopher had been there and cut off the roots irregularly five or six inches below the surface. He makes clean work of it. If he begins below where the roots begin to branch out, he takes every root. I have tried to look up his favorable record to see if we cannot find enough per contra to overbalance the injury he has done.

DRAINAGE OF MARSH LAND AND ITS USE IN GARDENING.

W. L. TAYLOR, LITCHFIELD.

This is a subject that has claimed the attention of the leading agriculturists, wherever land is valuable, since the earliest settlement of our country.

Not only is drainage beneficial from an agricultural point of view, but as a sanitary measure its value cannot be overestimated. Who can determine the value of drainage when it not only changes marshes into arable land but causes the deadly malaria to disappear forever, thus leaving our homes healthful and little ones happy? Too often the removal of a loved one from our midst is called a "dispensation of Providence" when the main cause was a marsh near the house, which ought to have been drained.

The home of my boyhood in eastern Illinois was a land containing many ponds and marshes. From my earliest recollections I can hardly remember a time when some one in our neighborhood did not have typhoid fever, and ague was so common that almost every one had a "shake" each year and sometimes for many months. Then they began to drain the marshes and tile the low lands and, oh, what a change it made in the healthfulness! Fever and ague almost disappeared, and the cases of typhoid fever were few and far between.

By the use of tile drainage the marshes where I used to fish are said to produce a hundred bushels of corn per acre.

My own experience of drainage extends over a period of thirty years. There was a large marsh on the farm where I now reside, and it was formerly inhabited by fish, muskrats and mosquitoes, and the surrounding lands were too wet for cultivation. Four hun-

dred rods of ditch four feet wide and three feet deep was dug, which caused the water to subside, and in a few years the marsh became one of the finest of meadows, and the adjacent lands were in a condition to raise wheat. More ditching was done from time to time, and we came to use a part of the marsh for a garden. Cabbage grew in abundance, onions yielded 600 bu. per acre. Tomatoes did well, but were apt to rot unless trellised. Celery grew to perfection. But the crop that paid the best was strawberries. They seemed to be right at home on that marsh. How luxuriantly those plants grew! How they labored through the warm summer days to pump water to produce those enormous berries, which we sold at 20 cents per quart! The amount of water we sold in those berries would have made any respectable milkman blush with shame.

Several years ago a fire ran over a part of the marsh, burning the peat from 6 to 12 inches deep. On this burnt strip the largest potatoes were raised, also corn and wheat, but it was too low for wheat except one dry season, when it grew straw five feet high and wheat that yielded 50 bushels per acre. We are satisfied that many of the marshes in Minnesota could be drained to great advantage to the owner.

By the use of tile drainage those unhealthy marshes may become fruitful gardens and a blessing to humanity.

Mr. H. H. Chapman: At Grand Rapids we have this problem before us, and it is one of the principal features. The marsh land of northern Minnesota occupies the largest territory in that section, and it is very largely composed of peat. If some of it can be redeemed it is a matter of very great importance to us. I do not think, however, a tile drain would be the practical method of draining the land because of its peaty nature. We have resorted to open ditches, and as far as our ditching goes, we find it costs us about 25 cents per rod; a man working at this rate will earn from $1.50 to $1.75 per day. It pays to surround the marsh completely, as it keeps the water from getting in.

Borers.—Good, clean cultivation is worth more than all the washes and dressings that can be applied to prevent borers. A good wash, however, is often worth many times what it costs to apply and will do much toward preventing the attacks of borers and other insects. A 1 lb. can of concentrated lye dissolved in 2 or 3 gallons of water makes a very good tree wash. Another good wash can be made of ½ pint pine tar, ½ pint carbolic acid, and 2 gallons soft soap. These washes can easily be applied with an old whitewash brush or a swab made of old rags tied on the end of a stick. The wash should be applied two or three times to the trunk and large limbs during the spring and early summer.—Okla. Exp. Sta.

PROPAGATING NEW VARIETIES OF TREE FRUITS FROM SEED.

C. G. PATTEN, CHARLES CITY, IA.

The secretary doubtless intended to have me tell you how to produce improved fruits from seed, and in so doing he assigned me a difficult task. But difficult as it is I shall undertake it cheerfully and hopefully, realizing that in the forward march in horticulture there is no place for pessimism. We catch no inspiration from halting doubt or from the deep shadows and mists of narrow valleys, but from the higher levels of mountain side and mountain top, where the vision scans the widening landscape of hills and valleys and sparkling rivers and sunlit heights.

We discard the ancient teachings that we must plant a thousand seeds to get one good fruit, or the later fact as given by Dr. Dennis, of Iowa, that it required the growing of a thousand plum seedlings at "Sleepy Eye" to awaken one Surprise. If reversion to lower types is such a potent factor in preventing us from producing improved varieties as some believe, then indeed is our Jordan "a hard road to travel."

At the Iowa state fair I once saw the grand cow Mercedes, that was milked three times a day and gave in twenty-four hours over eighty pounds of milk. I have seen herds of these cattle that were really very remarkable cows.

A Jersey cow, Mary Ann, of St. Lambert, made 936 pounds of butter in one year, and the most magnificent large dairy that I ever saw was of this breed of cattle at Spring Hill, Tennessee. Yet from Minneapolis to Des Moines I have seen all along the line great numbers of very inferior Holstein cattle, and I have also seen very large numbers of scrub Jerseys. What developed such results in these breeds? Surely they are good dairy cattle. Was it not want of forethought, want of selection, neglecting to weed out the inferior animals? Breeding from animals that reverted so far back to the ancestral type that they were at least 75 per cent scrubs? Mr. Gideon realized this fact in his endeavor to improve the apple. He knew that the air in his orchard was full of the pollen of the little acrid, austere Siberian, mean in almost every quality but hardiness. Hence his desire to establish an experiment station in southwestern Iowa, where he believed the conditions were more favorable for his work; and this is the reason why no better advance has been made with our larger fruits. We have put too little science and common sense into the formula and have too often forgotten the trite saying that "like begets like," or the likeness of a former ancestor.

We know but little of the ancestry of our fruit trees, and so we have need to be wiser and more thoughtful than the stockgrower. To breed improved fruits for this climate every element of perfection in tree and fruit that it is possible to find should be brought together. Hardiness, freedom from blight, vigor, leaves that are resistant to unfavorable combinations of heat and moisture, fruits that hang well to the tree until mature, good size, freedom from defect in skin, beautiful, productive and of as good quality as possible. Such a tree should hold its leaves for a normal length of season for the latitude in which we are working. Judged by these points, the Oldenburg and Hibernal are defective, for they both drop their leaves seven to ten days earlier than they should in the average season, and both also drop their fruit too easily. Our northern native plums are defective in dropping their fruit and shedding their leaves too early, and I have no doubt that these defects will be improved upon by crossing them with the Miner plum and some of its seedlings.

Innumerable and serious mistakes have been made all over the northwest in an endeavor to mingle the little Siberian with our cultivated apple, forgetting that violent crosses produce untold defects in fruits and plants, as well as in animals. Some of our most noted originators of new plums here in the west are, I fear, making this mistake, getting too far away from line breeding and mixing widely distinct types. What was once one of the most important stock centers of the west for high bred cattle has greatly deteriorated on account of this mixing process. A little Holstein, a little Short Horn, a little Polled Angus, and a little Jersey has wrought the mischief.

The mixing process is a scattering and diluting process nearly every time. In improving the apple for Minnesota and the northwest, we must have hardiness. "Then," says one, "you must go back to the Siberian." Not so, for it has been demonstrated by actual experiment that some of the third hybrids, like Whitney's No. 20 and Briar's Sweet, that are at least seventy-five per cent apple, will produce seedlings that are hardy and more free from defects than where the old Siberians were crossed with the apple. So that if we would make an all around advance with the apple, one of the parents should be such advanced hybrids as Sweet Russet, Minnesota and Meader's Winter, and better, if you know them, being sure that they hold both leaves and fruit reasonably well, and first rate, if possible. However, holding a large part of the leaves too late would be an indication of immaturity.

The seeming advantage that the stock men have with their highly developed breeds may be more seeming than real. The horticulturist has at least this advantage, that when he has once secured a Concord or a Worden grape, or a Wealthy apple, he can multiply them by the millions and have them exactly alike, while the stock breeder can only rarely exceed the high average of his herd, even with the most thoughtful care, and at best his failures will be considerable.

And there is still another feature that most horticulturists have overlooked in the production of new varieties; namely, that such plants and trees as the Concord and Worden grapes, the Ben Davis, Wine Sap, Fameuse, Duchess, Wealthy and the Patten's Greening apples and the Richmond cherry are the crowning results in horticultural evolution. They are to horticulture, whether produced by natural or artificial selection or development, what the Morgan horse is to horse breeders, Stoke Pogis 3rd to the dairymen and Bates and Cruickshank Short Horns to the producer of beef cattle. Such plants and trees are even more than thoroughbreds. They are the highest types of their race. They are the culmination of all the cumulative forces toward a higher perfection in horticulture. They are the prepotent individuals that establish breeds and families in fruits. Their seedlings are often as pronouncedly stamped as are the offspring of the Holstein or the Jersey cattle. And if horticulturists would pay attention to the scientific laws of development and breed from such plants, we would hear less about the deteriorating forces of reversion to lower ancestral types, and our table would not be burdened with a multitude of small and worthless fruits.

Of course, if we plant the seeds of inferior seedlings and their crosses, that fairly represent generations of worthless fruits behind them, the law of reversion will be strikingly manifest.

On the grounds of the writer are seedlings of known parentage already in bearing. Such as Duchess crossed with Grimes' Golden, Patten's Greening and Grimes' Golden, Pink Anis and Jonathan, Maiden Blush and a Duchess seedling—a cross of fall Pippin and Duchess—and Briar's Sweet with Pound Sweet and Wolf River also, and so on. Also four or five grand-seedlings of the Duchess with parentage partly known.

When we know that in such crosses as Duchess and Grimes' Golden we have hardiness and excellence of fruit combined, why not pollinize that tree with its own pollen, or pollen of the Patten's Greening and Grimes' Golden cross, instead of taking chances of dissipating and scattering the forces that we have already combined with the uncertain pollen of any other variety.

According to the written experience of Mr. Budd, the Duchess is a very prepotent sort, but by actual test on my grounds the reverse is true except in hardiness. I know of no variety that is more easily overcome by the pollen of another sort. It does perpetuate its hardiness to a reasonable degree. In one instance a cross of Grimes' Golden obliterated every trace of it both in tree and fruit, except as stated.

In conclusion, permit me to say that I believe that the practice of emasculating the stamens and cutting off the petals in pollinizing is faulty, and that we would reach higher results if we would let the flower remain intact. I believe that the Infinite Mind knows better than we whether the perfect maturity of both petals and stamens were necessary to the highest development of the embryo germ of the future fruit that is forming in the flowers.

There are so many instances on record of one plant when crossed on another where the pollinizing parent obliterated the characteristics of the other parent, that we cannot doubt that whether we practice heroic surgery or not on the flower, the fact still remains that one plant when crossed on another in its most natural and perfect condition will obliterate the distinctive characteristics of the other parent in their offspring. This is a broad field full of mysteries and surprises, and he who labors faithfully and lovingly in it will be sure to find happiness if not gold.

TWO MINUTE SPEECHES AT CLOSE OF THE ANNUAL MEETING, DECEMBER 7, 1900.

Mr. Jno. Freeman, Austin: The attendance at this meeting has certainly been a very joyous privilege to me. This is the first opportunity I have ever had of attending an entire session of this annual meeting. Personally, I have been greatly benefited, and I hope I may return to my home filled, and return to some extent to those who sent me up here to represent them and to enjoy this session much that I have received that may be of abundant benefit to many who are taking their first lesson in horticulture in the Southern Minnesota Horticultural Association. I want to thank you all for making it so pleasant and again wish to say that I enjoyed it very much.

Mr. A. P. Stevenson (Manitoba): I am sure it has afforded me a great deal of pleasure to meet the horticulturists of Minnesota here during their annual meeting. I have learned a great deal from the veteran horticulturists down here which I know will be of great value to us adjoining your state on the north. These things which I have learned here will encourage us up there, and it gives me courage to hope that we yet have a prospect of growing fruit to some extent. We know that in past years you were somewhat in the position in which we now are in Manitoba, that is, you were experiment-

ing and deriving knowledge from the experience of others, and from what I have learned here I will endeavor to carry back to our society as much information as I possibly can. I thank you for the kind reception you have tendered me and hope you may have the greatest measure of success.

Mr. C. M. Loring: It is an honor to be a member of the Minnesota State Horticultural Society. Quite a number of years ago I was an active member, but ill health made it necessary for me to be away for sixteen consecutive years during the time you held your annual meetings, and, therefore, I lost my membership. When I think of where we started, of the few little crab apples that used to be brought and put on the tables, and then look at the tables in the exhibition room today, it seems to me every member in the association should feel proud that he has been interested in aiding to accomplish that we now see before us. It hardly seems possible when I look back and think how much discouragement we met with and how little of success, that gentlemen like my friend Mr. Harris and some of the older members here should have kept right on trying to raise apples in the state of Minnesota. I can assure the gentleman from Manitoba who just spoke that there could be little more reason for discouragement in his country than we had to contend with in Minnesota. I know nearly every one was at work and interested in horticulture in the early days, taking an interest in nearly everything that came along. We bought trees from the Rochester nurseries—and nearly everything we did buy came from Rochester—we would plant them in the spring, and the next spring they were dead. Of course, that is very discouraging. When we see what is before us and what has been done by that grand old man, Mr. Gideon, it certainly seems to me this society should raise a monument to his memory.

Prof. N. E. Hansen (S. D.): Instead of saying anything about the meeting I wish to speak about something else. I have enjoyed the meeting immensely, and I am always glad to come, but I want to give you a sort of prophecy of a time say forty or fifty years in the future. I believe by that time we will have found the apple we are looking for, an apple that will keep until apples come again, that will be hardy in the northern part of the state, even in Mr. Stevenson's country and the Canadian Northwest. I believe very many of our wild fruits will have been civilized and developed to a high state of perfection, and that we will have a pomology of our own that will give us a long list of fruits we have not today.

The history of cultivated plants extends back, as in the case of the apple, five thousand years; from time immemorial the apple has been cultivated in Europe and Asia. The history of that and a great many other cultivated plants contains a great list. We find two kinds of selection in plant life, one the unconscious and the other is conscious. An unconscious selection is along the slow amelioration of plants through the centuries, ages and ages, as generations come and go, but in the last few generations conscious selection has been practiced more and more, and we have come to breed plants like animals, and the work is vastly quicker than it was in the early days

of man's life on this planet. In the early days man had to subdue wild nature; he had to fight against all the forces of nature for a chance to live. As he has conquered nature in more recent generations, he has more time to devote to the improvement of plants, he can get plants of a higher development than the ordinary gardener is able to get, he knows more of the forces and principles that underlie the development of plants; so if he keeps on his selection and breeding he will do more for plant life in the northwest in a generation than a thousand years would do by the old method of unconscious selection.

Mr. J. S. Harris: Of course, I had my say last night over at the banquet, but I was just thinking what a fine thing it would be if we could be our grandsons after we old fellows have thrown off this mortal coil. For more than thirty years I have been preaching the doctrine that Minnesota would come to be not only a good apple state, but a good fruit state in other respects. I remember about thirty years ago at a meeting I was theorizing about what could be done with the native crab and plum by improving the quality and hardiness of our common apple by crossing with the crab, and a learned man who sat near me said: "I would hate to expose my ignorance like that." It kind of hurt me, but it did not put me down. We have hardier fruits than we had thirty years ago and better, and in those days we old fellows did not know anything about this artificial hybridizing that is going on at the present time. If we could only be our grandsons and have another thirty-four years in the society we would see the garden of Eden filled with all kinds of fruits and inhabited by the happiest people on earth. (Applause.)

Mr. J. S. Trigg (Iowa): Mr. President, the time is far spent, and the friends wish to go home, and I only wish to say one word, and that is to bid you a hearty God-speed in the good missionary work you are doing. It has been left to you men assembled here the last few days to do a grand work in this state in which you live. It is a mission of beauty and home, it is a mission to improve the school house, it is your mission to preach that the almighty dollar is not the only thing to be sought after, and your mission is a grand one in uplifting the life of the community along this line of horticulture. You do a splendid work here, and I go back to my own state carrying with me the knowledge of what you have done and are doing, and it is an inspiration to me as one from outside your society, and I am sure our people will be glad to hear the report I have to take with me at this time. I wish you all prosperity and success and the pleasure of finding that thousand dollar apple you are seeking after. (Applause.)

Capt. A. H. Reed, Glencoe: I have been trying for the last forty years to learn something about horticulture. Some forty-three years ago I commenced to plant apple trees in Minnesota. I sent to Rochester, New York, in 1857, I think, for some trees, but I found myself a perfect failure in trying to be a horticulturist. I have spent a considerable sum of money in buying trees at different times and trying to learn what I could about raising apples, but it has been, I might say, a failure. While I have got trees growing, trees that

are twenty years old, they are all, I think, of the crab varieties. This past summer I have been out considerably through the smaller towns from St. Cloud south to Albert Lea through the counties of Wright, McLeod, Sibley, Nicollet and Blue Earth, and from what I have seen this summer it has renewed my belief that we can raise apples in this state. I have seen trees of standard apples growing and hung so full that they had to prop up the limbs, and so plentiful that some farmers did not pick them up from under the trees, and I believe Minnesota is yet going to be one of the best apple growing states in the union. I have commenced again to set out apple trees. I set out some two hundred and fifty last spring, and I am going to set out some every year, and I believe I will, eventually, succeed. I am satisfied I never did take hold of the matter right, but through the information I have received here and will receive in the future I believe I can make a success of it.

Mr. J. S. Harris: I would like to tell something about Capt. Reed, something that will atone for his failure in horticultural practice. Capt. Reed has the honor of being the father of the farmers' institute of this state. (Applause.) He is the man that got a few of us cranks together before the state would give anything, before anybody would come to an institute, but we held quite a number of institutes at the expense of Capt. Reed, and I know we will all consider that what he did in that direction will amply atone for all his shortcomings in horticulture. (Applause.)

Mr. Oliver Gibbs, Wis.: Mr. President, I hardly expected to find my name on the list of prophets in this race. I never thought I would have to come into active service again. When the sharp young man sees an old man coming down the street, and he does not want a reminiscence he takes to the nearest alley, but when two old men meet on the street there is a moment of happy conjunction of venerable heads. When I was visiting with my old friend ex-governor Turner, of Nebraska, he said to me he thought he had better quit trying to keep up with the crowd, and I thought I would have to follow his example, but I have changed my opinion entirely. I believe the proper thing for us old men to do is to keep right on sawing wood and die in our tracks doing it. At the same time bear in mind that we have got to be succeeded by somebody, and we must bring these young men into training to be always ready to step in and take an official position in the horticultural society.

The Secretary: There have been between thirty and forty young men attending this session; they are all interested members, and they are going to stay. There is a lot of young blood coming in that is going to help in the future.

Prof. C. B. Waldron (N. D.): Mr. President, one of the greatest things that is accomplished by this society is the missionary work that is being done, the extent of whose influence is found throughout the whole northwest. Except for the fact that I had drawn courage and inspiration from my visits and from the reports of this society, I have seen many times in the last ten years when I felt like lying down and giving up every hope of trying to instill any horticultural feeling or spirit into the people of North Dakota. Last

spring I went to a real estate agent for a man in Wisconsin who wanted a piece of land to grow fruit upon. He did not want to sell any land for fear he would beat the man out of his money. When a real estate man has that kind of a feeling he must certainly have an idea that fruit cannot be raised. It gives you some idea of the interest that exists among those people in pushing horticultural progress. The greater part of your work consists in stimulating more or less confidence in those newer regions that lie outside of the direct influence of your society, and I am glad your society exists to that grand end, and I want to thank you for the encouragement I receive every day from the work you are doing in stimulating confidence in northwestern horticulture. (Applause.)

Mrs. L. A. Alderman (S. D.): Mr. President, I feel indebted to the Minnesota Horticultural Society for even the little I know in the line of horticulture, but I feel a good deal about my horticulture like the old resident of California who was asked to prophesy what kind of a winter they were going to have. "I don't know," he replied, "I have been here too long; ask some tenderfoot." I have the feeling that I don't know as much about horticulture as I did ten years ago, the cause of blight, etc., things I feel quite lost about; yet we have had some good measure of success in raising apples and small fruits in South Dakota, and I came all the way from there to sit at the feet of these Gamaliels and learn what I could. I feel amply repaid. I thank you. (Applause.)

The President: Sometimes we are a great deal like those boys when they arrive at the age of sixteen to eighteen when they know more than their fathers. I have often advised them to write a book and have it printed and preserved, because they will never know so much again. (Laughter.) We all remember those early days that have been so feelingly alluded to by my friends, Harris and Reed, when everything looked dark and gloomy, and we were all at sea, no light anywhere to guide us, no mark to guide our pathway, not even so much as the mariner had who went out to sea fifteen or twenty miles on a dark night and dropped a shingle every half mile, thinking on the way back he would pick them up and thus find his way to shore. We had no such guide as that, not even a shingle to guide us. But now we have got onto terra firma, we feel that our feet are on solid ground, we are feeling like Archimides wanted to be. He said: "You give me ground solid enough to stand on and a lever long enough, and I will move the world." We have got the solid ground and the question is whether our lever is quite long enough or not; but it is growing, and everything in the horticultural line is beginning to move, and it has been moving rapidly the last two or three years, and its course is still upward and onward. What the end will be not even the most sanguine can prophesy.

Secretary's Corner.

THE HORTICULTURIST AT THE IOWA EXPERIMENT STATION.—The place left vacant by the departure of Prof. Craig some months since has been filled by Homer C. Pierce, late assistant horticulturist at the Ohio State University, who comes to his new field with a good reputation as a practical worker, and, as the "Fruitman" says, "with no local prejudices."

APPOINTED ON THE FOREST RESERVE BOARD.—Gov. Van Sant has announced the following appointments on the State Forest Reserve Board for the ensuing two years:

Judson N. Cross, Minneapolis, to represent the state forestry association.

Greenleaf Clark, St. Paul, to represent the state agricultural society.

M. W. Williams, of Little Falls, to represent the state horticultural society.

TO TEACH AGRICULTURE IN THE "RURAL SCHOOLS."—The state legislature at its late session, appropriated $2,000 to pay the expense of preparing and distributing lesson helps, etc., to be used in teaching "agriculture, home economics and rural life generally" in the country schools of the state—to be expended by the Agricultural College management. This plan has received much attention from Prof. W. M. Hays lately, and he was, no doubt, largely instrumental in securing the appropriation. Members of our society will watch this movement with large interest and much faith in its practical results.

HORTICULTURAL REPORTS FOR THE STATE TRAVELING LIBRARIES.—The state legislature two years since passed a bill, introduced and championed by our fellow member, A. K. Bush, providing for a system of traveling libraries. This innovation has proved a decided success and there is a strong demand, for more material to work with in this field. To help along, at the suggestion of Mr. Bush, fifty copies of the report of this society for 1899, the next to the last issue, have been furnished for use in these libraries this year. The reports of the past year are too nearly gone to spare any for this purpose.

STORING REPORTS AT THE EXPERIMENT STATION.—To insure greater safety in the diminishing stock of surplus reports of this society, about half of those heretofore held at Pillsbury Hall, State University, have been removed to Horticultural Hall, at the State Agricultural College, in St. Anthony Park, and are stored there in the charge of Prof. S. B. Green. The following is a list of reports so removed: 1881 paper 100, 1882 paper 100, 1883 cloth 100, 1884 paper 50, 1885 paper 100, 1886 paper 80, 1889 paper 16, 1890 paper 100, 1891 paper 50, 1892 cloth 100, 1893 cloth 100, 1894 cloth 100, 1895 cloth 100, 1896 cloth 100, 1897 cloth 100, 1898 cloth 100, 1899 cloth 100.

DO YOU PLANT TREES?—The Minnesota State Forestry Association still has a few copies of "Forestry in Minnesota," a 312 page practical treatise on forestry, prepared by Prof. S. B. Green and used as a text book at the School of Agriculture. Write at once if you desire a copy. Sent postpaid for 5 cts. in paper covers; 25 cts. cloth bound.

Membership fee (permanent) in the association is $1.00, which includes a cloth bound copy of the above publication and 10 Douglas spruce seedlings.

Plant distribution. Douglas spruce, 2 cts. each, postpaid. A limited number of 6-inch seedlings of the above will be distributed by the association

this spring, in quantities as desired. This variety bids fair to be one of the best evergreens for ornamental or timber plantings and should be given a trial. Very rapid grower, hardy, graceful and of beautiful color and appearance. Instructions given with order. Apply at once to Geo. W. Strand, Secy., Taylors Falls, Minn.

NEW QUARTERS FOR HORTICULTURE AT THE STATE FAIR.—The state legislature, at the session lately adjourned, made an appropriation of $25,000 to pay the cost of erecting an agricultural building on state fair grounds. This structure, the contract for the erection of which will soon be let, is to be for the joint use of both agriculture and horticulture, though the term "Agricultural Hall" is not an incorrect title, the general term, agriculture, embracing also horticulture and other kindred subdivisions. As near as can be judged by the plans under consideration, the building will be some three times the size of the present "Horticultural Hall," and will furnish ample space for both interests. The fruit and flower displays will probably be allotted a space somewhat larger than in the old building. Will *you* be there next September to help "shine up" the new quarters?

THE OX-EYED DAISY A LEGAL OUTCAST.—Among the laws passed by the late session of the state legislature is one directed towards the extermination of this most familiar flower. As a law it has been made sufficiently drastic. Under it one may be imprisoned ninety days for allowing this plant to grow on any land he owns or controls. Should this law be successfully enforced most of the owners of unoccupied real estate in this city would from now on for some time be transacting business from the interior of the county jail. It might be well, as an educator and an object lesson, in the case of this and similiar laws, for the public authorities to set an example by exterminating plants so interdicted upon the public highways and on other lands under public control, or otherwise they should consistently arrest, fine and imprison themselves. Until this is done it is hardly to be expected that private citizens will generally heed these laws and they will remain, as in the past, practically dead letters. Let the public set the example—and they will do it when there is a sufficiently strong public sentiment behind them to secure a general enforcement. Such laws are in the right direction, but our people need to be educated up to them.

MR. AND MRS. A. G. TUTTLE CELEBRATE SIXTY-THIRD WEDDING ANNIVERSARY.—Mr. A. G. Tuttle, of Baraboo, Wis., has been for many years an honorary life member of this society, an honor he is fully entitled to by reason of his long services to the horticulture of the northwest. He and his wife have lately celebrated a wedding anniversary much beyond the usual alotted limit of the average married couple. "They were married in Northfield, Conn., and came to Wisconsin in 1846, settling in Madison, where Mr. Tuttle was for a short time engaged in the mercantile business. In the spring of 1847 he went to Portage and opened the first store in that place. A year later he removed to Baraboo where he and his wife has resided ever since. Mr. Tuttle started the first nursery in the state and is still engaged in that business. He has always taken an active part in horticultural affairs and served several years as president of the State Horticultural Society. He was the first nurseryman to introduce the Russian apple trees into this country. Notwithstanding his age, 87 years, Mr. Tuttle is still active and walks to town, nearly two miles, almost every day for his mail. His wife is 84 years of age and has been an invalid for several years. They have four sons, A. Clark, of Baraboo; Herbert, of Mather; Edward, of St. Paul; and Merritt, of Ft. Morgan, Colo."

GLIMPSE OF HOME OF THE LATE JOHN S. HARRIS, SHOWING HIM AND A FAVORITE GRANDSON ON THE PORCH.
FROM A PHOTO TAKEN BY PROF. S. B. GREEN SEVERAL YEARS AGO.

THE MINNESOTA HORTICULTURIST.

VOL. 29. JUNE, 1901. No. 6.

SEEDLINGS IN 1900.

J. S. HARRIS, COMMITTEE.

(Report made at last Annual Meeting.)

It has been a favorable year for the fruiting of seedling apples, and hundreds of varieties in different parts of the state have produced bountiful crops. Owing to the carrying out of a long-cherished plan of visiting my native state, Ohio, and spending an entire month among the scenes and surroundings of my boyhood days, I have been able to visit but few of our seedling orchards, and these only in the way of other business.

In August I visited the seedling orchards in Houston county belonging to John Holtz and Ole Oleson. There are more seedling varieties in these orchards producing fruit of good quality, large size and fair appearance than at any other place I have seen in the state, and the trees did not appear to have been injured by the winter of 1898-99. I have mentioned these orchards in previous reports, and consider them well worthy of being looked after.

At Edward Null's, town of Union, Caledonia county, there are two fine seedlings from the Duchess, bearing fruit of about the same or rather better quality, and keeping well from one to two months later. But very few apples have been sent to me so far this season for examination. One, named St. Antoine, sent in by R. Parkhill, of Chatfield, has at least the merit of great beauty of appearance, and is said to be a long keeper. The fruit is of large medium size; round, oblate form; colored yellowish ground nearly covered with orange and crimson in stripes and splashes; flavor, a mild or subacid sweet.

L. W. Prosser, of LeRoy, has sent me a number of samples of an apple that I am unable to identify, and so far have not found any one who is able to help me out. I think that it is either a seedling or a graft hybrid. The fruit equals the Ben Davis in size and appear-

ance; is much like it in form but of better quality. He states that in ordinary seasons it has kept well through the entire winter. A plate of them are on exhibition at this meeting.

W. L. Allen, of Spring Valley, has also furnished me samples of a very pretty, medium sized apple that he reports as keeping until late in the spring, and he thinks that the tree is entirelv hardy. He does not know that it is a seedling. It is hardy and a long keeper. I estimate it to be of more value than either the Malinda or Repka Malenka.

There were large and fine exhibits of seedlings shown at the late state fair, but I have not been furnished with samples for examination and cannot report intelligently upon them. The largest collection was from the orchards of the late Peter M. Gideon, but I am inclined to the opinion that the collection shown by D. F. Akin, of Farmington, was not very much behind it for real merit and quality.

I feel safe in reporting that good progress is being made in the originating of new seedlings of value, and that our people are on the right road to secure a reliable pomology adapted to this climate.

In the exhibition at this meeting, there are a few varieties that appear to be worthy of looking after. One originated by Andrew Wilfert, at Cleveland, is of most desirable size, form and color, and is said to keep well until late in the spring. Mr. Alling, of Homer, exhibits a yellow apple of good size and form that keeps well all winter. Frank Yahnke, of Winona, shows a small, high colored, red apple that he calls Double Stars; a very late keeper, and tree believed to be extra hardy.

There are a number of other seedlings in the exhibition that, so far as appearance and quality go, seem to be well worthy of propagation for trial. Among such there are a number of varieties in the extensive collection of D. F. Akin, of Farmington.

RASPBERRY PLANTS are more certain to live and make a good healthy growth if allowed to send up a new growth from three to five inches above the ground before transplanting. This plan requires more time in setting than if while dormant, as at that time you are unable to tell whether they are winter killed or not. In setting plants that have made several inches growth, place them one inch deeper than when dug, preparing the earth firmly over the roots with the foot.

GROWING GOOSEBERRY AND CURRANT PLANTS.

GEO. W. STRAND, TAYLOR'S FALLS.

Currants may be increased either by cuttings, layers or division of old plants. Where only a few plants are wanted and old ones of that variety are accessible, if sections are taken which are fairly well rooted and composed of the newer growth, they will make very good and vigorous plants, but it is preferable to start them by either of the other methods.

For commercial purposes currants are grown almost exclusively from cuttings. These are made from the new growth soon after the leaves fall, which is about the 1st of September in this latitude. They are made six or eight inches long and tied in bunches, having the butts all one way. Although some plant them at once, it is preferable to callous them first, as this hastens the rooting process. This may be done by placing them in the ground butts up, covering them enough to prevent them from drying out. Fermenting manure is sometimes used to hasten it. As soon as calloused and before the small roots start they should be set out about four or six inches apart, in rows from three to four feet apart, set firm, in a slanting position, leaving only the upper bud exposed. A mulch of straw, applied soon after, will also be of great benefit, removing the same from just over the row before growth starts in the spring. Cuttings thus treated will have roots started before severe weather sets in and are in condition to make the best plants.

If necessary they may be set early in the spring, but they do not stand near the chance of growing or making as good plants as fall planted cuttings.

Thrifty one-year-old plants are all right for transplanting, but two-year-olds give the best satisfaction generally.

Currants root very readily by layering. This may be done during the fore part of the growing season by bending down and partly covering the new growth.

Gooseberries do not start as easily as currants from cuttings and are grown mostly from layers. The layers are generally started as soon as the new growth is long enough to conveniently handle in June. These are taken up in the fall and transplanted into rows, about six inches apart, to be grown for one or two years the same as currants.

Another method of starting gooseberry plants is to hill up the two-year-old plants that are to be dug that fall. This will cause roots to form in the newer growth, and a good stock of layers can thus be procured with very little labor or expense. The trimming up which the stock thus receives will be more beneficial than injurious.

In starting layers, if a cut is made in the lower side—making it rather long and almost to the centre of the stalk,—so it will stay apart when pressed back into the soil—this will greatly aid the formation of roots, as they start more readily from a calloused surface. In fact, this is about the only way some varieties of the gooseberry and other hardy plants, such as roses, can be induced to root to any extent when propagated in the open.

As in the production of other kinds of nursery stock, the season, soil and care has much to do with the quantity and quality.

The President: I would suggest that these cuttings be set in very shallow trenches and very near together, two inches apart, and have the ground slope a very little, so that in a dry time you can throw a pail of water on to the upper end of the shallow trench and water every little slip in the whole trench in that way at the same time. In that way you can water three or four hundred in a minute. If you put them farther apart you will have to carry more water.

Mr. Frank Yahnke: In dry prairie soil it will be very much better if you make a trench to fill in before planting with sand and then set your cuttings in immediately and cover in with common dirt. They will start right away.

Mr. Oliver Gibbs: Has there been any difference discovered in the fruiting qualities between layered and cutting plants? Does the layered plant bear better than the cutting?

Mr. Yahnke: I never noticed any difference between layers and cuttings, and I have planted both extensively, but there is a difference in the bushes. I would not like to propagate from any bush that is not good; it might influence the progeny.

Prof. E. S. Goff (Wis): The gentleman stated, and I think we have been taught in books and other publications, that only young wood should be used for cuttings. I visited one of our largest Wisconsin currant growers and was surprised at the way he did his propagating. He did not use young wood, but he took his cuttings from the older wood. He took the prunings from the oldest branches that got down where the currants got dirty. He cuts them out and then he cuts the branches off at every joint and leaves on a small shoot of young wood which he uses as a cutting. They were very finely rooted; in fact, I found they were so nicely rooted that I could make several plants of them. It may possibly mean earlier bearing. This gentleman said he had adopted this method, because he found it better in his own work. He cut them off in the spring and planted them in the ground. I wish to be understood, however, that all of these cuttings had a bud at least of young wood, or one or two buds of young wood somewhere on them, but they included a portion of the older wood, so that every branch of old cane that has an inch or two of young wood can be used for cuttings.

Mr. W. D. Harris: I have tried a similar plan in propagating gooseberries. The method is early in the spring before the bushes have started growing to bend them down and cover up entirely the old limbs, and the buds will break through and will make a mass of rooted plants before fall.

VARIETIES OF GRAPES BEST ADAPTED TO MINNESOTA.

J. W. MURRAY, EXCELSIOR.

If I were raising but one grape for profit, I would raise no other but the Delaware. Next, in the line of red grapes, is the Brighton. That is one of the finest grapes grown in the northwest. Next is the Iona. I am located in one of the most favorable grape regions in the northwest, on the south shore of Lake Minnetonka. It will ripen there in most situations. The Rogers No. 15 is a very fine grape, subject to the objection that after four or five years it will mildew. Now to get to the black grapes. The Concord stands at the head so far as grapes raised to sell are concerned. My experience is, and it is borne out by the testimony of some of the most prominent commission men, that the only grapes that it will pay to grow to sell are the Concord and the Delaware. They will not pay as much for any other kind of grape as they will for the Concord and Delaware.

Then there is the Janesville. Where you must have a hardy grape or none, it is valuable. Where you can raise the Delaware or Concord it is not worth ground room. Moore's Early would be the king of grapes if it bore as heavily and the vines were as reliable as the Concord, because it is considerably earlier. Black grapes are the same to most people. With me the Moore's Early proved such a poor bearer that I finally dug them all out except a dozen for my own use. It is a poor bearer, and it is very hard to get a good vine because the spurs will kill out in the winter time. I dug them all out. The Cottage grape is a fine, good grower, the grape is very sweet; but after mentioning those qualities the list is exhausted, and it is hardly worth ground room. The Lady and the Martha are two white grapes, and we have found they do not do very well with us. They are tardy bearers and light bearers, and all such things are useless to raise for profit. I could make twice as much from some other varieties. Then there is the Prentiss. I used to look through the grape books and wish I could produce such grape vines as were produced in the books. In the Prentiss you have just such a vine as you see in the books. It branches very beautifully, too much in fact; it is a very fine vine, very hardy—a white grape and pulpy and solid. I often wondered how so many grapes could be packed on a stem. It has a rather peculiar growth, and on the whole it is hardly worth raising.

Of the new grapes, Campbell's Early is an eastern grape of the black variety, of which I do not know enough to speak intelligently.

One more that is a great grape with grape lovers, and that is the Niagara. It will hardly ripen in this locality. It will only ripen in the most favorable localities we have and then not fully; it is such a fine grape for cooking purposes that many people tell me it is the best grape I raise. I do not recommend it for eating or market purposes, but it is a peerless grape for cooking and canning. You will have no market for it unless you educate your neighbors around you, but if you give them only one basket full or enough to put up a pint jar you will have buyers for all the rest. It produces some of those great white clusters of grapes, and as I said before there is nothing better in the shape of a grape for cooking or canning and so different from the others that it might pass for some other fruit. When you have tried it once you will want it afterward. It would not pay to raise unless you want it for your own use or had established a home market for it for cooking and canning purposes, because it will not ripen, and it is only good for the purposes which I have stated.

I have briefly and hastily mentioned a few varieties that can be grown in our section of the country.

Mr. O. M. Lord: I corresponded with Mr. Rogers of Milton, Fla., and he wrote me once, "I have a bunch of Niagara on my desk, and I am trying to make myself believe it is good." They are raised in Florida in large quantities and do finely there. I do not pretend at all to say that they should be eaten from the vine; they should only be raised for the purpose of cooking and canning.

SUBSOILING AS A PREPARATION FOR FRUIT CULTURE.

DAVID SECOR, WINNEBAGO CITY.

As we look at the grand display of fruits exhibited by members of this society, we are led to believe that a bright future is before us and that our land is a goodly heritage.

Owing to a diversity of soils and subsoils within the state, the same method of preparation for fruit culture and the same treatment of the soils does not apply in all cases.

In localities fruit culture is attended with a reasonable degree of success without special preparation being made before planting other than to have the surface soil in a fair state of cultivation. This method may be attended with fair success where there is a fertile soil with a porous subsoil and good natural drainage.

An important matter in the planting and successful cultivation of fruits is to have sufficient drainage to prevent water from remaining in pools or ponds on the surface for any considerable length of time. If the subsoil is a hardpan or a stiff clay impervious to

water, and the surface irregular so as to form basins where water remains in pools until removed by evaporation, it should be ditched and tiled to carry off all surface water.

Thorough preparation of the ground, by draining where necessary, and deep culture of the soil and subsoil is the key to success in fruit culture.

Franklin, in his Poor Richard, said: "Plow deep while sluggards sleep, and you shall have corn to sell and keep." This couplet of Franklin's so far as it relates to deep plowing applies with much force in the preparation of ground for fruit culture.

Horticulturists are generally agreed as to the advantage of digging a broad, deep hole where young trees are to be set, and then filling it in part with fresh pulverized earth, for the young rootlets to rest on in planting the tree. But if it is good to thus loosen the earth when the young tree is planted, it is equally beneficial and, I may add, important to loosen the subsoil to a considerable depth and for a much greater distance, for the benefit of the tree in after years, when through growth the roots have extended far beyond the limits of the hole in which at first planted.

It does not need argument to convince members of this society that during periods of severe drought a loose, porous soil and subsoil retain moisture much better than a hard compact soil. Our observation and experience have demonstrated this fact.

According to Prof. Ansted, "A good soil should be composed of nearly equal parts of three earths, sand, clay and lime; it should imbibe moisture and give it back to the air without much difficulty; it should have depth sufficient to permit the roots of the plants to sink and extend without coming to rock, to water or to some injurious earth; the subsoil should be moderately porous, but not too much so; and in case of need the subsoil should be able to improve the soil by admixture with it. Three essentials to plant growth most likely to be lacking in cultivated soils are nitrogen, phosphoric acid and potash."

By chemical analysis, made by the Commissioner of Agriculture, of soils and subsoils taken from ten different localities, it is demonstrated that potash equals an average of two per cent, and that the subsoil contains slightly more potash than the surface soil.

As potassium sulphate is one of the best and most extensively used of the commercial fertilizers, and, as has been demonstrated by analysis, the average subsoil contains a larger per cent of potash than the surface soil, it follows that pulverizing of the subsoil and mixing with the surface soil increases fertility and is in most soils beneficial.

THE MINER PLUM.

(A discussion.)

Mr. W. L. Taylor: The Miner is the choicest plum I have on my place. They grow immensely and are doing very well, but they seem to be a tardy bearer. This was the second year they bore, and they have been grafted on the wild stock seven years. I have been told they bear a great deal better a little later, and if any one has the variety I would like to hear from him.

Mr. O. M. Lord: It will not stand the winter on my place. It invariably kills down.

The President: I was afraid to touch the Miner plum because I thought it not safe. How many have tried it? (About 10.)

How many of you think it is a tolerably safe plum so it will warrant one in raising it? (About 6.)

Mr. C. W. Merritt: At Winona it is a shy bearer. It needs grafting.

Mr. J. S. Trigg (Iowa): I have a neighbor who grew the Miner plum for fourteen years. It grew and blossomed profusely but never bore a plum. Last year he went down in the woods and cut two wild plum trees in bloom and stuck them in the crotch of the Miner plum tree, and they bore the largest crop of fruit I ever saw. Last year he did not do it, and he did not have any fruit. My experience is that you have got to plant it with other trees in order to have it bear any fruit. If you will do as a gentlemen said a few minutes ago, graft some other variety in it, you can get plenty of good Miner plums.

Mr. H. M. Lyman: I have grown the Miner for about thirty-five years. After a very cold winter it kills back and does not bear well. For the last five years I have raised fine crops.

THE MINNESOTA CRAB.

(A discussion.)

Mr. C. G. Patten (Iowa): I would like to inquire how many have tried the Minnesota crab and how many would recommend the tree. I ask this question on account of the fact that I would like to know the degree of hardiness the tree possesses.

(A large number raised their hands.)

The President: How many would recommend it for hardiness?

(About all.)

The President: Is there any one who would not recommend it?

(A unanimous negative.)

The President: How many find it blights?

(About five.)

Mr. A. B. Lyman: In Carver county the Minnesota crab is making a fine showing. A man living near our place is so taken with it that, not knowing the name, he has had some scions cut to propagate it.

Mr. Frank Yahnke: I think as much of the Minnesota crab as of any apple I have. I planted the trees twenty-five years ago last

spring, and they are very healthy trees. They bear good crops every other year and a light crop the year between. The apples are fine eating, and it is a good sized apple. It takes well in the market and at home. It does not look much like a crab.

Mr. A. P. Stevenson (Man.): We have it in our orchard in Manitoba with a great many other crab trees, and we find it is as healthy and hardy and vigorous as any of them. It has fruited with us and furnished us a very desirable little apple.

Mr. C. E. Older: We consider it in our part of the state as one of the very best. It is a nice eating apple, free from blight, a good grower and simply indispensable.

Mr. C. G. Patten (Iowa): What is its season?

Mr. Older: It is a little later than the Wealthy.

Mr. Patten: From all that I have been able to learn of the Minnesota crab it is one of the most valuable of the large hybrids that we have in all this northwest for experimental work in developing new and better varieties. It has a large percentage of apple in it, it has hardiness, freedom from blight and general good qualities. There is no question there is in this apple the cross of a distinctive winter fruit, so I believe it is one of our very best.

Mr. Andrew Wilfert: I live in this locality, and it is the only tree I have on the place that blights, and as far as I am concerned I cannot recommend it.

The President: Has it borne?

Mr. Wilfert: Yes, sir.

The President: Is this the apple? (Indicating.)

Mr. Wilfert: Yes, that is the apple. It had about three barrels of apples this year, but it blighted badly.

Mr. Wilfert: I had some Transcendent trees, and when I grubbed them out I thought I had got rid of the blight, but the Minnesota blights almost as bad.

Mr. Frank Yahnke: Did the tree stand near the Transcendent?

Mr. Wilfert: Yes, sir.

Mr. Yahnke: That's where it got it.

Mr. U. Tanner: Is there any place where you can find a market for the Minnesota crab?

Mr. W. L. Taylor: The Minnesota is the most prolific bearer in Meeker county, where I live. I had some this year, and you could not see the body of the tree for the apples. They told me they had picked eight bushels from four trees. They usually keep well, but with us they did not keep well this year. It is the most valuable we have in the county.

Mr. Wm. Allen: I fruited them four or five years. They were a medium sized crab apple, and the trees were very late; the crop was large, but like the gentleman over here I would like to know where to find a market for them. The children would not eat them, they would pick them out.

Mr. S. D. Richardson: That is the Minnesota crab without any doubt. We do not regard it as a first rate apple. It is all right as a shipping apple. It is a first rate cider apple. It is not a good apple, and we have little use for it. It is as near an annual bearer as it can be.

Mr. Frank Yahnke: I must dispute that point a little in regard to not finding a sale for the Minnesota crab. I can sell Minnesota crabs as fast as I can bring them to market. I have got the same market Mr. Allen has, and I cannot bring them in too fast to suit my customers.

Mr. Seth Kenney: I raised the Minnesota crab, and they were about the only apple the boys would not steal. (Laughter.)

Mr. C. E. Older: Before the Minnesota comes in season it is not good for anything. When it comes into season we can market in our place all we can grow.

Mr. J. S. Trigg (Iowa): It will give the small boy a bigger stomach ache than any apple I know of. (Laughter.)

Mr. D. T. Wheaton: I believe that is the apple a good many people are looking for.

NOTES ON THE WINDBREAK.

A. TERRY, SLAYTON.

You must remember that I come from a portion of the country that is perfectly treeless. When I first went there we had nothing to break the wind, and to speak about growing apple trees in such a country as that seemed almost ridiculous. I considered that by planting forest trees at the same time that I planted hardy apple trees, they would grow sufficiently fast for a protection. I remember I used to plant a row for every foot in height, supposing that would give protection on one side. I made my first experiment on the open prairie, digging the holes and planting, in my ignorance, the Fameuse apple tree, and immediately following it by a willow hedge. However, absurd as it may appear, it was a step in the right direction. I found the Fameuse apple was very well protected by the willow hedge that was planted afterward.

I have heard so much from our society about beautifying our homes. One of my greatest anxieties was to keep the boys at home, and another anxiety was to get good neighbors, and I believe a man located out on the open prairie can do nothing better than to plant apple trees and plant shelter groves, and we should use all of our little judgment as to what kind of a shelter grove we plant. I passed the other day a shelter grove where a large amount of money had been spent, and there was only one kind of tree, that was the cottonwood, and the faster they grew the less shelter they were, and they compared well in color with the snow beneath them. Again I should have other trees planted near them. After having planted there several times I have come to the conclusion that the most important point is to plant nurse trees; that is to say, plant the largest number of trees that are not the healthiest and hardiest, and it will

help the more permanent trees to grow. The old box elder that we all know so well is one of the best nurse trees we have. The ash tree, which I believe is a lasting tree with fine wood—and more heat, I believe, can be obtained from ash wood than from any other wood we grow in Minnesota, and it is hardy. The only fault and the only objection is that the leaf is taken off by a worm. Still the box elder planted on either side will remedy that to a great extent, and it will do in one year what it would require three years to do without the box elder. I grew it by planting in a grove three or four of a kind in each row, and that will enable one to cut out afterward inferior trees and forest trees of a mixed kind.

Perhaps I can just allude to this, that as the leaves of the trees spread themselves before the sun an analysis is performed in which something goes into the sap of the tree, and when that sap is changed it begins to return in the wood and tree. Those leaves as they show themselves to the sun take in different colors of the sun. If you plant the same kind of tree, one next to the other, you will naturally find that the trees will not do so well. For instance the ash tree, which is of such a different color from almost any other tree, will grow alongside a strip of cottonwood or any other kind of tree that has not very extensive branches, and the simple reason is that one tree takes in a certain color from the sun while the other tree takes in other colors of the sun, and I found for that reason it was better for me to mix my trees.

Another thing that is needed to make our trees a perfect shelter is to be sure that we have a smaller grove and a thicker grove on the outside of our groves. My plan used to be to trim up the inside rows of my trees, trim them thoroughly. By the way, in the matter of trimming we have great complaint of the soft maple not being a hardy tree. The principal reason for that is that people will usually trim them in the spring of the year, and in such trimming they are injuring the tree, and by extensive bleeding for one year in three or four years afterward the tree loses its vigor and dies. Therefore, we should be careful at what time of the year we trim our trees. I used to allow the outside trees to grow without trimming, and I found it a great benefit. Since then I found a new plan. Your friends up here used to ridicule me because I knew nothing about the evergreen. Now, I begin to place the Scotch pine with the European larch, and they will thrive; then place the European larch to nurse the Scotch pine, and I find by that mixture and placing them outside the grove for the sake of economy, I find that a small grove that is reset will turn more wind than a large grove of tall trees trimmed to the very outside.

Here is another thing that may interest some of your professional nurserymen. I found when I went to the old country such trees or shrubs as the rhododendron making such a magnificent showing that I wished the North Star State could grow rhododendrons and scatter them throughout our western groves. I found they used lilacs, syringas and other shrubs. I found it was easy to propagate them very cheaply for the outside of the shelter groves and it would make a better windbreak and everybody would admire the home, and if they admired the home they would admire me. We get the benefit of both beauty and utility. I am speaking now not only to the nurserymen, but to those who like myself are amateur prairie settlers. Don't be afraid of the cost of these things. The cost is not high if you will only order them of your nurserymen by the hundred and place them as I have said, and you will find they will serve you thoroughly.

Mr. W. L. Taylor: If one row of red cedar is placed near the windbreak it makes a thorough protection. They will grow in almost any soil, and with us we find it one of the finest windbreak trees we have.

OPERATIONS IN WORKING THE SOIL IN GROWING RASPBERRIES AND BLACKBERRIES.

W. S. WIDMOYER, DRESBACH.

As others will tell us how to properly prepare the soil for planting these fruits I will commence with the cultivation.

We plant blackberries in rows eight feet apart, the hills being four feet apart in the row; raspberries in rows seven feet apart, three and one-half feet apart in the rows, letting them grow together in the rows after the first year.

We plant early potatoes and tomatoes between the rows the first season, always planting early potatoes between the black raspberries in order to get the land clear in time to layer the tops to raise our plants. In planting this way we can cultivate both ways a good share of the first season.

As soon as the berries and potatoes are planted, we go over the field with a small fourteen-tooth cultivator, and as soon as the potatoes are up go through again with a large one, and hoe around the hills with hand hoes, keeping the cultivation up, at intervals of ten days or two weeks, until the potato vines cover the ground, when cultivation should be discontinued until the potatoes are ripe and dug. Then we give the black raspberries one more good cultivation and, if necessary, hand hoeing, to properly fit the land for layering the tips and put it in shape for winter.

The second year the first cultivation is given with a small corn plow, as soon as the land is in condition to be worked, throwing the earth towards the rows. In about a week, the cultivator is run through between the rows, and hand hoes used between and around the hills. If the land is not very full of weed seeds, one hoeing is usually sufficient, but the cultivator is kept going until picking time, and in dry seasons all through the picking, which is as late as we like to work among the canes except to loosen the soil with the corn plow or cultivator if it has become packed hard by the pickers.

After the second season the earth is thrown away from the rows at the first plowing, there being quite a ridge left where the canes were laid down and covered during the winter. As the berries are left to grow together in the rows after the first year, the hand hoe is seldom used after the second season, but we use a small three-tined potato hook to pull the dirt from among the plants after plowing in the spring. This does the work very thoroughly and leaves the soil in good condition. The past season was so wet we did not get this work done as thoroughly as usual, although we had everything in good shape when the raspberries commenced to ripen. About a week after we had commenced to pick, we cultivated half of the reds again, when the rainy weather set in again and prevented any further cultivation until too late in the fall. Those that received the extra cultivation gave a much better yield than the rest.

MOVEMENT OF THE SOIL IN THE SUCCESSFUL VINEYARD.

C. W. SAMPSON, EUREKA.

In the first place, in laying out and planting a vineyard the soil should be thoroughly prepared. It should be plowed very deep and, if possible, subsoiled, stirring the ground for a depth of sixteen inches. It is a good plan before planting to use an Acme harrow, which will thoroughly pulverize the surface and settle it so as to resist the drouth. After the young vines are set the soil should be kept thoroughly cultivated during the early summer up to about August 1st. After that time only the surface soil should be stirred very lightly, only enough to keep the weeds in check. Every fall it is a good plan to use a one-horse plow and plow up the entire surface between the rows, throwing the dirt towards the vines and leaving a dead furrow in the middle. This leaves the soil perfectly loose, and it will not freeze so deep as it otherwise would. It also leaves the soil in good condition for cultivating the next spring. Care should be taken to run plow shallow so as not to cut any roots.

Mr. J. W. Murray: I would like to second very heartily what was said a while ago about this fall cultivation. I got caught once or twice by freezing weather before I had my grapes down, but wherever I had gone over the ground the day before it was not frozen at all. Plowing in the fall leaves the soil in good condition for spring working, and I think it would be a valuable winter protection against freezing.

MY DUCHESS ORCHARD.

C. L. BLAIR, ST. CHARLES.

I began to set trees in Minnesota in 1855. My first orchard consisted of 468 trees of such kinds as the Roxbury Russet, Rhode Island Greening, Seek-No-Further, Early Strawberry and other varieties hardy in the east. The best of this first orchard was killed in the winter of 1884 and 1885. I began setting out my first Duch-

C. L. BLAIR.

Old Duchess orchard in bloom on place of C. L. Blair, at St. Charles, Minn.

ess trees in 1870 and 1871. I do not remember the exact number of Duchess trees I set out, but as I had not at that time begun to make protectors for my trees the mice and rabbits destroyed a good many of them. Some of the trees were injured by sunscald. This injury I think is done mostly in the months of February and March, about the middle of the day, from eleven to two or three o'clock, when the

sunshine thaws the bark on the southwest side of the tree. For several years I raised corn or potatoes in my orchard.

I do not think that the Duchess are early bearing trees, as least mine were not. I began to mulch my trees about 1880. I have seldom failed to make a good crop of Duchess apples. Some years we have had more than 1,000 bushels. This year they were very full of fruit, but owing to the great drouth and high winds, a great many apples dropped off, and on account of the drouth we do not think that they were quite so large as they usually are.

I have generally mulched my Duchess trees about every other year. I try to have a space mulched about as large around as the limbs cover. In ten acres of orchard we pasture some eighty or one hundred hogs, including pigs.

MANIPULATION OF SOIL NECESSARY OR PROFITABLE FOR A PLUM ORCHARD.

DEWAIN COOK, WINDOM.

Plum trees should make a strong growth each season, until they get to bearing profitable crops. This can best be accomplished by cultivation of some kind, and if a goodly quantity of stable manure is incorporated into the soil the results will be more satisfactory.

Mulching a newly set plum orchard should never be resorted to unless cultivation is impracticable, for the reason that the mulched trees will not grow near as vigorously as will the cultivated trees.

When the plum orchard gets to bearing freely, we have to be careful not to cultivate too deep, especially close to the trees. When the orchard gets to bearing heavily we prefer to have the soil as near to forest condition as we conveniently can, which, of course, precludes any cultivation whatever, mulching the trees instead. The plum, if allowed, will in one season fill the surface soil full of fine roots, feeders for the fruit, and any cultivation which disturbs these feeders will reduce the size of the fruit.

The winter of 1898-9 I hauled stable manure and mulched all of my plum trees that were large enough to bear a bushel or more of fruit to the tree, putting it on thick enough to keep down most of the weeds and covering the ground completely. Well, the season just passed we harvested some two hundred bushels of fine fruit from those mulched trees. My neighbor, Jos. Wood, in noting the heavy loads the trees were carrying, said: "The trees could never have matured the fruit if you had not fixed them up."

I am not in favor of mulching, even the older plum trees, year after year, but think advantage should be taken of non-bearing seasons and plow under a lot of this mulching, and then harrow, cultivate and mulch again for the next season's crop.

Good crops of plums are often grown without mulching being resorted to, but better crops can be grown by using stable manure for mulching. After all, circumstances must largely govern our actions in this, as in other matters.

The point I wish to bring out in this paper is this: Cultivate for growth of wood, but mulch for fine fruit.

Mr. Frank Yahnke: What do you do for killing weeds when you do not cultivate close to the trees?

Mr. Dewain Cook: I take a sharp hoe and cut them off; sometimes I take a scythe.

Prof. Robertson: May I ask Mr. Cook why he gets more growth by cultivation than by mulching:

Mr. Cook: That is true of young trees; I don't know why it is so, but it is so.

Prof. Robertson: I have commenced that mulching already, that is the reason I asked the question, and, as Mr. Cook says, I know one orchard that has had a hundred loads piled on it during the last ten years. I know another orchard that has had oat straw piled on it in rack loads so as to cover the ground two feet deep, and I know that orchard blights less than any other I know. I commenced as soon as I could and gave those trees a good mulch with this strawy manure to keep the weeds down, and if that is not right I would like to know what the injury would be.

Mr. C. W. Merritt: It would not injure them at all if you should give them heavier manure; it would only feed the trees a little heavier. Put on manure enough to form a mulch instead of putting on straw manure; put on heavy manure, and you attain two results at once. Where I live we cultivate all our young trees three or four years, that gives them a good growth, and after they branch out too far to cultivate we go to work and cover the ground thoroughly with very heavy manure.

Prof. Robertson: How do you get close enough to cultivate?

Mr. Merritt: We cannot get close enough to cultivate after three or four years, but by dodging around under the limbs a little you can get at the trees. They have orchard cultivators where the wings pass between the rows and cultivate next to the trees.

Prof. Robertson: In case you cannot cultivate what do you do?

Mr. Merritt: In case I cannot cultivate I mulch. I feed the tree at the same time.

Mr. Clarence Wedge: I am quite surprised at friend Cook's heterodox doctrine in regard to the management of the plum orchard. I had supposed that it was a very well settled fact that the best management consisted in continual cultivation to keep the soil open, while manuring was very important in keeping up the fertility

of the soil which the plum craves so much, but in order to combat the enemies which take refuge in litter and mulching, and in order to get the best fruitage, I thought it was advantageous to keep the orchard in a continual state of cultivation. So far as the difficulty in reaching the trees is concerned, I think that could in a measure be obviated by using a cultivator with wings for the purpose of cultivating close to the trees. Some of the nicest plum trees I have seen were on the grounds of Mr. Gardner, at Osage, Iowa, and he kept his trees thoroughly cultivated.

Mr. Martin Penning: I mulched some plum trees some eight or ten years ago with rich manure and killed them all. I think the manure was too rich; anyway they all died next summer. I have a plum orchard planted twenty years ago, twenty-four trees in a row each of De Soto, Forest Garden and Weaver, and the last three or four years the trees looked bad, and the fruit was small. Last fall I looked at them, and as they did not suit me I decided to throw them out. Digging those trees out I found that the side roots were all killed and nothing alive but the tap root. Those trees had all died back and did not have much growth left. I mulched the rows along the east and west sides, I put in a lot of manure, but in those dry winters the straw blew from the west to the east side and on the west sides the ground was perfectly bare, the straw had all blown off, and on those trees from which it was blown away there was nothing alive but the tap root; they are all dead now. I think it is a good plan to mulch. I don't think much of this idea of planting 10x10 feet; that is too close. I planted an orchard three years ago, and I set the trees 12x16. The principal trouble with most farmers is that their trees bear too much, but it makes them feel good to see so much fruit on the trees. Two-thirds of that fruit ought to be removed in order to keep the trees healthy. Then mulch or cultivate. That is the way I treat my trees.

Mr. J. S. Trigg (Iowa): Do you mean to say you killed trees with manure?

Mr. Penning: Yes, sir.

Mr. Trigg: What kind did you use?

Mr. Penning: Cow manure. I piled it around the trees to a depth of three or four inches.

Mr. Trigg: What do you think was the trouble?

Mr. Penning: I think it was too strong, it soaked into the ground and killed the roots.

Mr. Trigg: How did it affect the roots?

Mr. Penning: The roots looked as though strong lye had been put on them.

Mr. Trigg: I cultivate mine very week except when it rains, and I cultivate as soon after a rain as I can.

The President: What is the objection to the Washington plan? The Washington harrow extends four or five feet on each side of the team and the team goes along midway between the rows. Let the harrow be about as wide as the distance from one row to another, and let those wings of the harrow run under the branches and cultivate as near as you can to the trees.

Prof. Robertson: We cannot find men who will be careful enough of the trees.

The President: That is the way they do it out there; they spread the harrow and let it run under the branches. It is simply a broad harrow, and they hitch the team to the center.

Mr. C. W. Merritt: There is no question but what the harrow or any cultivator will do better than any mulching you can put on. At the same time if you are going to mulch put in a lot of poultry to do the scratching and so get rid of the insects.

Mr. C. E. Older: I have had the best success in cultivating with a one-horse cultivator, the Planet, Jr., cultivating close up to the trees and mulching in the fall; then in the spring I cultivate thoroughly, keeping the ground rich to keep the trees growing well, and in the plum orchard, especially with the De Soto, that method gives me the best results. We had twenty bushels of De Soto on a setting of thirty trees two years ago. That fall I manured with a good, rich manure and then cultivated early last spring.

Mr. Dewain Cook: Mr. Penning in his remarks stated that he was quite positive that the manure killed his plum trees. I do not like to have that statement go out to the public, because my opinion is that Mr. Penning had plum trees grafted on stock that was too tender. I bought my plum trees from ———— nurserymen, grafted on tender stock, and they were less hardy than a peach. They all root-killed the first winter, and it is my opinion they were killed from that cause. The tap root indicated that they were killed from cold.

Mr. Martin Penning: Those trees that were killed were the Miner, and I wanted to take very good care of them, so I mulched them with that heavy manure. I believe the manure was too sharp, and in support of that opinion I will state a case that came under my observation. A neighber of mine had a cow yard in the same place for fifteen or twenty years. He kept from thirty-five to forty head of cattle. Some years ago he decided to break up that yard and plant it to an orchard. I told him the ground was too strong, that he would kill his trees, but he planted the trees, and they all died the second year, all that were in that cow yard. I think the manure was a little too sharp.

Prof. N. E. Hansen: I think the point Mr. Older made should be emphasized. I live where we have the same conditions as obtain in Mr. Older's locality. If you mulch with manure and keep on mulching it will bring the roots near the surface, and sometimes they will root-kill. If you mulch in the fall, you can cultivate the next spring and summer and thus prevent the roots from coming too close to the surface. The point that Mr. Cook made about tender stock should be emphasized, and it explains a good many dead orchards. In regard to covering raspberries and other small fruits, the sooner we get out of that idea of covering raspberries the better. The average farmer will not do it: if he has to cover his fruit he will not grow any. I find where we covered carefully they did not do well the next year. We must take our native wild fruits and fit them and breed them up to a good standard, and it will take

a shorter time than any of you realize, and then they will not need to be laid down.

Mr. A. P. Stevenson (Manitoba): I was very much interested, indeed, in the discussion of the mulching of the plum. We grow considerable of the native plum, the Cheney, the Wyant, the Weaver, etc., and we have never found mulching necessary. We cultivate and manure, cultivate very thoroughly, but the orchard has never been mulched, and we get very good crops. From some of the best, like the Wyant, we sold ten dollars worth of plums, and did as well also with some of the Cheney. These three or four varieties were practically bare, but we have not found it necessary to mulch. We cultivate with the horse cultivator and use the harrow to keep down the sprouts. Now in regard to the other question of small fruits, the mulching of the red raspberries. We find the Cuthbert is too tender with us, but the Turner, Philadelphia, Kenyon and Loudon gave paying crops, but we find we have got to protect the blackcaps by bending them down and covering in the usual way.

Prof. Hansen (S. D.): I would like to ask Mr. Stevenson how deep the snowfall is in his locality.

Mr. A. P. Stevenson (Man.): During the last winter in our locality we did not use sleighs. We have had to use the wagon the last two years because there was not enough snow for sleighing. Other years we have a fair average snowfall, some ten or fourteen inches, but for the last two years we have had no snow in the locality where I reside.

Mr. J. W. Murray: Don't you protect the Loudon at all?

Mr. A. P. Stevenson: We do not find it necessary to protect the Turner, the Philadelphia, the Kenyon or the Sarah. The Sarah is a variety that originated in Ontario. And then we have another variety, originated by Dr. Rieder. But we found it necessary to protect the Cuthbert and the Golden Queen.

TRANSPLANTING AND CARE OF EVERGREENS.

PROF. C. B. WALDRON, AGRICULTURAL COLLEGE, FARGO, N. D.

The coniferous evergreen occupies a peculiar place among the commonwealth of trees and is, therefore, possessed of unusual characteristics and habits that must be taken account of in its cultivation. It is a remnant of the early geologic times when continents were smaller and oceans larger and warmer and the uniformity of the seasons was such that it was not necessary for a really successful tree to have one garb for summer and another for winter.

Before the mountains were brought forth to disturb the ancient monotony of uniform and sufficient rainfall the primitive conifer did not find its beautiful character of unchangeableness and constancy a handicap in the race for life. Though there were no great rich alluvial plains such as characterize the present geologic time, yet the coarse and rocky soils of the earlier periods furnished it such

conditions as met its requirements best. As time passed on and conditions of forest growth became more difficult, through the development of great continental areas with extremes of heat and cold and periods of drought, the evergreen responded in a measure by developing narrow leaves with a protecting coat of resin. Because of these changes the evergreen still survives amid surroundings that are surely uncongenial enough for our own comfort, but on the other hand just because it is an evergreen and persists in retaining its tenderest parts in season and out of season we must meet and reward its faithfulness by unusual and intelligent care.

We may not revive the genial monotony of the triassic period, but in one way and another we may lessen the effect of great or sudden changes and in the same measure increase the possibilities of success in cultivation. Within the past ten years I have transplanted several thousand evergreens, ranging in age from five to twenty years, and through all degrees of success and failure have come to understand fully that the evergreen will not readily endure marked and sudden changes in temperature or moisture. If one would succeed with them in localities as difficult as the one in which I have worked, he must not neglect this cardinal principle. The surest way to attain this end is to plant the evergreens in a grove or woodland, where the soil doesn't usually become very dry, nor bake very hard, nor freeze to a great depth. In addition to the modifying effect upon the soil the surrounding trees temper the sun and wind and tend to prevent loss of moisture, which, by the way, is a more active cause than any other in bringing about the death of evergreens.

It will be objected right here that most of those who would plant evergreens in the northwest have no grove to begin with. If such is the case the struggle to get evergreens established will be a hard and expensive one, and unless there is some ameliorating circumstance, such as a ravine or northern slope of a hillside, to modify the unfavorable climate, one had better spend his time at first upon quick growing hardy trees, depending upon them to later furnish the conditions requisite for growing evergreens.

The only native evergreens in North Dakota are in the extreme western part of the state, where the rainfall is only thirteen inches. Down in the deep ravines that characterize the Bad Lands and extending to a considerable distance up the north side of the Buttes, the red cedar finds a fairly congenial home, and though the dwarfing effect of the dry climate is rather pronounced yet the trees are vigorous, green and thrifty. The surrounding hills afford much the same protection from drying sun and winds as would be found in a forest.

In the larger towns the clustered buildings afford some such conditions, and evergreens are grown with a reasonable measure of success. My own efforts have been toward growing evergreens in open and exposed locations. Where several hundred have been grown in a body and the whole protected at the sides by belts of deciduous trees ten to twelve feet high, the experiment has been really successful, but of the isolated specimens and clumps of a dozen or so here and there but a few of the hardiest ones remain. Single specimens planted among deciduous trees that had made considerable growth have also passed two years successfully.

In the Red River Valley, where the fall is usually dry and the snow fall apt to be light, the ground becomes dry in winter, and in freezing wide cracks open up that extend to a depth of several feet. Nothing can be more fatal to trees than a condition like this, and to prevent it I continue the cultivation of trees up until the time that winter sets in, and if the soil is unusually dry add a good covering of mulch, for the double purpose of retaining the moisture and delaying the freezing as long as possible. Whatever tends to make the soil loose and friable also keeps it from freezing so deeply, and for this reason deep cultivation seems to be an advantage. I find a one horse moldboard plow a convenient tool for this purpose, to be used about the middle of the season, afterwards gradually working the furrows back with an ordinary cultivator. The transplanting of an evergreen is quite as important a matter as its subsequent care.

I will pass over those points that must be taken account of in every locality, points that you, at least, are all familiar with, and speak only of those measures that apply especially to conditions found in the prairie regions of the northwest. I would meanwhile beg your indulgence for any savor of the first person that these remarks may have, as I am somewhat of a pioneer and have not been favored with the opportunity to personally observe the work as carried on by others.

When the trees are small so as not to make the process too expensive, I find a good time to transplant evergreens is in very early spring before the ground is thawed out. The holes for the trees are dug the fall before, and the soil around the tree may be loosened up with a narrow ditching spade so that the part left directly about the roots of the tree may be taken up intact when the time comes, without great difficulty. Filling in around the tree after it is placed and covering with a mulch completes a process that probably cannot be improved upon so far as good results are concerned. After this, the best time seems to be early in June, when the tree has well started its season's growth and keeps right on in spite of the shock of trans-

planting. If evergreens be transplanted after the ground thaws out, but before the buds start, many of them are inclined to carry out the process of living with such foliage as they already have and neglect to develop new shoots or, at least, defer it until very late in the season. Even deciduous trees sometimes attempt to get through the season with such activity as the chlorophyl in the young twigs affords, but with them a severe pruning is sufficient to awaken them to the duty of putting forth leaves. As this is impossible with evergreens, it is generally conceded that middle spring is not a good time to transplant.

Looking toward the end that deep freezing is to be avoided so far as possible, the soil in which evergreens are planted should be loosened to a great depth. Four feet is not too much for a tree six feet high. If the soil is hard and clayey, the object will be still better accomplished by filling in the bottom with coarse gravel and brickbats with enough good soil to encourage the roots to grow downward below the frost line. When this position of the roots is once attained, so that they may supply the moisture given off by the tree in the bright, sunny days of winter, it may be considered a permanent feature of the landscape.

Of the half dozen varieties of evergreens grown on the station grounds at Fargo the white spruce easily stands first in hardiness and general good qualities. Individual specimens of the arbor vitæ and jack pine have endured the vigors of many seasons and are still unscathed. The most hopeful feature in the cultivation of evergreens in the Red River Valley lies in the fact that they don't freeze to death but, instead, suffer worst in mild and open winters, from causes that are more or less under our control. The most fatal period in the last ten years was in March, 1895, when strong warm winds blew from the south, and with fatal caresses induced the exposed ones to give up their last spark of life. In days to come sheltering groves will furnish a benign protection, and in the future, as in the remote past, the evergreen will grace with its rich verdure the land of the Dakotas.

Mr. W. L. Taylor: I would like to ask you about the trimming you spoke of.

Prof. Waldron: Well, the idea is to get the trees down deeper in order to get the roots below the frost line; it is necessary to get the roots down deep.

Mr. A. P. Stevenson (Man.): Have you the Scotch pine?

Prof. Waldron: Yes, but they all killed out in that marsh. The ground was pretty well dried out, and they could not supply the moisture.

Mr. G. D. Taylor: Do you find the jack pine easy to transplant?

Prof. Waldron: Yes, we have some there, and they are doing very well.

Mr. Alfred Terry: Do I understand the gentleman to say it was safe to plant in the fall?

Prof. Waldron: No, never in the fall, but in the spring after the buds are started. Some had shoots on nearly an inch long.

Mr. H. H. Chapman: Do you consider it necessary to plant evergreens at the depth at which they were originally grown?

Prof. Waldron: No, I set them deeper.

Mr. Chapman: What is your idea in doing that?

Prof. Waldron: The deeper we can get them without cutting off the lower branches the better; we want to get the roots below the frost line, that is the idea.

Prof. Hansen: I believe the jack pine in northwestern Minnesota is worth looking after. It is the hardiest thing we have at Brookings.

Mr. A. W. Keays: Which is the best time to transplant the jack pine.

Prof. Hansen: About the same time as other evergreens, early in the spring or late in the spring after the buds have started, about the first of June.

IRRIGATION IN THE MINNESOTA GARDEN AND ORCHARD.

P. M. ENDSLEY, MINNEAPOLIS.

The average annual rainfall in Minnesota if properly distributed through the growing season of each year is sufficient to produce satisfactory results in the cultivation of the orchard and garden, but if unevenly distributed, as during the past summer, serious loss will follow unless irrigation is resorted to, and even in a season of average rainfall proper irrigation will materially aid in the growth of the largest quantity of fruit and garden produce of the highest quality.

In 1897 I commenced planting fruit trees and plants on my farm at Lake Minnetonka, near Fairview, and, believing that I could accomplish far more by having ample moisture, I made some investigations as to the method of irrigation used in this state, and in my researches ransacked all government bulletins and reports on the subject of irrigation that I could find for suggestions and example, but found little that covered the real conditions of this locality.

However, in the spring of 1898 I constructed an irrigating plant, covering eleven acres of the farm above referred to. The water is raised by a six horse power gasoline engine and 5x8 triplex pump, located 150 feet distant and seventeen feet above the water in the lake. The water is brought through a 4″ iron suction pipe to the pump and then forced through 400 feet of 3″ discharge pipe into a

300 barrel tank, which is elevated thirty feet above the ground. Two 3" discharge pipes run out from the tank in different directions, and the water is conveyed over the land through about 5,000 feet of different sizes of pipes, which are required, by the sprinkling system, to cover all parts of the eleven acres.

One and one-fourth inch iron hydrants are located along these pipes ninety-five feet apart. Water is distributed with sprinklers attached to ¾" galvanized iron pipes, made in sections of fifty feet, consisting of three pieces twelve and one-half feet long and made flexible by connecting them together with four sections of rubber hose three feet long. In applying the water, I use twenty-six of these sprinklers, each of them covering a space sixteen feet to twenty-five feet in diameter, according to the pressure of the location. The water is allowed to run through each sprinkler from thirty to forty minutes in one place and then changed to a new location. About one-third of the time of one man is required to place these sprinklers in position and change them to new places.

The pump has a capacity of one hundred gallons per minute, and when the tank is full and the hydrants open the water is forced through these sprinklers as fast as it is pumped into the tank. Two acres per day can be irrigated in this way, covering the land with water one inch deep. The quantity of gasoline consumed by the engine during a day of twelve hours was about ten gallons, which at 12 cents per gallon amounted to $1.20 per day, or 60 cents per acre.

When the plant was first constructed, in 1898, I distributed the water by running it through V shaped wooden troughs laid across the rows, and through openings in these troughs the water ran out and down the furrows between the rows, but I found that the water soaked into the soil to such an extent that at least six inches in depth were required before all the land would be fully covered. About 28,000 gallons are required to cover an acre one inch in depth, and in order to irrigate an acre by this method at least 168,000 gallons of water would be required, or nearly three days' constant pumping.

After using this method one season, I became convinced that the conditions and requirements in this locality were entirely different from what they were in the arid regions of the west and southwest, and that one inch of water applied at the proper time, in a proper manner, with adequate cultivation after such application, would keep the soil in fine condition for at least ten days, and that three such applications would keep all plants, shrubs and trees in a thrifty growing condition and carry them safely through a pretty severe Minnesota drouth.

In the spring of 1899, acting on these convictions, I changed the method of distributing the water to sprinkling and found that when there was water in the tank I could apply it evenly, in any quantity desired, on any part of the farm, or in different parts at the same time, by simply attaching the sprinklers and opening the hydrant valves. During the severe drouth of last summer, I applied water to my raspberries only twice and obtained an excellent crop of fine berries, especially from bushes one year old. Apple and plum trees planted in 1899 which were watered last year when the leaves were withering, and twice this year, have made more than the usual growth and with the loss of but one plum tree out of 150 planted. Not one apple tree was lost out of 181 planted. My lawn and ornamental grounds, consisting of about one acre, were kept in fine condition all summer, but on the lawn water had to be applied oftener than it did where the soil could be stirred and cultivated. Everything in the garden flourished, and from 120 hills of watermelons planted in it 700 fine, luscious melons were grown, which commenced ripening as early as July 15th. From fifteen rose bushes planted last year fully 1,500 fine roses were picked this last season. About 100 ornamental trees and shrubs, planted rather late last spring, made a vigorous growth without any loss of trees or shrubs, notwithstanding the dry weather. In fact, everything to which water was applied gave excellent results, and I did not find any bad results from applying water to any kind of plants in the hottest sunshine.

Methods of irrigation must vary according to conditions and requirements in different localities, and much depends upon the proper application of water in any locality, not only from an economical standpoint but to obtain the best results. The beginner in trying to solve these questions without a full knowledge of practical irrigation does not always succeed, and the Minnesota State Horticultural Society can render valuable assistance in the successful cultivation of the Minnesota orchard and garden by adopting some intelligent method of investigation of the subject of practical irrigation.

Drouth-Resisting Strawberries.—Some varieties of strawberries have greater ability to withstand drouth than others. McKinley, Yale, Ideal, Crescent and William Belt, in the order named, were found most resistant last season by the R. I. Experiment Station, while Haverland, Parker Earle, Princess, Hunn and Bubach, in this order, suffered the most.

COUNTRY SCHOOL GROUNDS.

MISS LUCIA E. DANFORTH, NORTHFIELD.

A city school may have a beautiful building but can not have very beautiful grounds; a country school can not have a very elegant building, but every country school can have very beautiful grounds. In spite of this fact, and in spite of the fact that the greater part of a child's most impressionable years are spent there, most of the country schools which we see are a by-word and a desolation. Box-like structures, apologetically resting on a treeless, wind swept prairie and crowded in by luxuriant corn fields! We have all seen them and shuddered. Fortunate are those of us who received our early education in the pitifully few ideal country schools.

There are three objects to be secured, pleasure, education and beauty; there are three methods of securing these objects, judicious selection, respectful letting alone and labor; there are three classes of people to do this, the women, the men and the youth.

There are some neighborhoods where little is necessary save judicious selection. There may be a place where our two acres can be secured near a brook, which furnishes skating in winter, clam shells in summer and beauty always; near hills which furnish coasting, a windbreak and scenery; possessed of natural trees and lovely views; having, withal, enough level ground for base ball. If there is such a place in the neighborhood, let us select it, rejoice and put in some hitching posts to save the trees, and then put our attention and labor on the school house itself. But there are many neighborhoods where there is no such place, and our two acres must be on the treeless prairie. Then some labor must ensue. Two acres are allowed by the law, and two acres, at the least, we must have.

I have made a plan where the school house faces south. The school should be near enough to the road to leave at least an acre and a half in the rear for a ball ground. After this our main work will be planting—planting trees, planting shrubs, planting flowers, planting vines, and after this planting more trees, planting more shrubs, planting more flowers, planting more vines and with and after it, protection. On the north should be a windbreak, not of Lombardy poplar but of evergreens. What to select our "Horticulturalist" tells us every year, but some hardy and beautiful trees are the white spruce, Colorado blue spruce, red cedar, red pine, white pine, arbor vitæ and, perhaps, balsam fir. This windbreak of evergreens should also continue on the west side unless it would shut off some beautiful view. On the east side we might have a hedge row instead of a wire fence, which is dangerous and hideous, and instead of nothing, which tempts encroachments by adjoining

farmers, a hedge row of blush rose bushes, barberry and the many, many beautiful wild shrubs of Minnesota, which would be easily planted, easily kept and beautiful all the year.

In front and at the sides of the school house great variety is possible. As many trees of the native Minnesota kinds as possible should be placed here. This is not only for beauty but for education. It is said that William Hamilton Gibson when a mere boy knew all the trees of his locality, even in the winter. Not only our city but our country boys often know few of the varieties in their state, whether in spring, summer or autumn—far less in winter. Here is a place which can, with little expense and divided labor, be made an arboretum. What if an oak will not be full grown for two hundred years? It will be educating the children who plant it and will cause our successors to rejoice in our existence. Elms are beautiful from the first and have the great advantage of winter beauty. Maples will rejoice us with their autumnal glory and spring sap. Willows and birches are graceful and pretty, even when small. The ash is hardy and regular. The black walnut, hickory and butternut speak for themselves. Some of our wild crabs are very lovely and, of course, hardy.

Mountain ash trees are short lived but give the winter brightness, which we need. This question of winter brightness is a serious one, but we can have willows with colored bark, bittersweet and evergreens and some black or red oaks and birches, which keep their leaves late.

It is often said that trees will not live, and, indeed, some of our school grounds are cemeteries for departed trees, planted but unprotected. The young trees must be carefully protected on the southwest to avoid sun scalding, and on the other sides to resist bovine encroachments.

Beside trees we should have shrubs. One of the great beauties of England and one of our own unnecessary lacks is in these beautiful shrubs. There is no reason for this. The Horticulturist frequently gives lists of beautiful shrubs which are hardy in Minnesota. Lilacs of various sorts; elder, green and golden-leaved; syringa, spiraea Van Houtii, Tartarian honeysuckle, snowball; barberries, common and purple-leaved; flowering currant, Juneberry, the strawberry tree, and many another, doubtless, are perfectly hardy.

One point seems to me very necessary. While we all believe in co-education, and while the country girl may play baseball with her brother, boys and girls should each have part of the ground sacred to themselves. Behind the school house should be a close hedge, separating the parts, and thick clumps of evergreens and shrubbery,

thus ensuring that independence and privacy which are absolutely essential and are almost universally neglected.

Great beauty can be added to the grounds by vines, and nothing is lovelier than the wild grape vines, the clematis and the woodbine, which grow everywhere in our woods, are perfectly hardy and need no care. If the school house is stone or brick it can be covered with the variety of woodbine so plentiful in Faribault and Northfield and, perhaps, elsewhere, which clings to brick and stone without support.

As to flowers, much must depend on the interest and permanency of the teacher, but some flowers can be managed in every neighborhood. Wild flowers can easily be transplanted, such as violets, dicentras, trilliums, asters, brown eyed Susans, anemones and golden rod; self perpetuating garden flowers, such as lilies of the valley, perennial phlox, iris, columbine, golden glow, peonies and phlox. To these may be added countless others if the teacher is the sort to be interested and to realize the importance of this study for the children.

But a school yard should be not only a place for the children but one for the whole neighborhood. It is not feasible in most places to have a separate park, but its school grounds may take the place of one. They should be appropriate for picnics, for Fourth of July speeches, for family outings. There should be a few garden seats. The big boys of the school can make them and would be glad to. There ought to be a box in which to throw papers or odds and ends, that even the country accumulates. The lawn can be improved by sprinkling white clover on poor places.

The approach to the school can be made more attractive by planting avenues of trees. A strenuous effort should be made to eradicate the fast spreading poison ivy.

The grass can be mowed with a field mower.

Excellent plans are given in the Cornell bulletin, No. 160, published at Ithaca, N. Y., at the agricultural station.

Now as to the method and workers. The women of the state have been given the unsought privilege—and a privilege is a duty—of voting in educational matters. They should go to the school meetings with suggestions. They should request the appropriation of twenty-five, ten, five dollars, as the case may be, each year for the improvement of the grounds. They should have a sub-committee appointed as park committee or committee on school grounds. The men will in most cases be glad to help, and the young people, I believe, always. Much should be made of Arbor Day. It should be a festive occasion when men, teams, women and

children come together to labor for the neighborhood home—the country school.

Children are nature lovers, if they are ever introduced to nature; they are beauty lovers, if they are allowed to see beauty. They are enthusiastic, optimistic, altruistic. What I have told of requires little money, no natural advantages, little save enthusiasm, optimism and altruism in the fathers, mothers and teachers, working together with each other and with the children and youth, who will always seek the best and highest as the best and highest presents itself to them, and who will give loyal and appreciative service if loyal, appreciative service is expected.

Mr. L. R. Moyer: I live on the prairie in western Minnesota. There they put the school house in the middle of the middle section which makes it a half mile to any road, and there is little around a school house except plowed fields. It is difficult to do any landscape gardening under such conditions. The first thing to do is to get the school house moved to the center of the township. Have only one good school house in the center of the township. Have the children delivered the same as cans of milk are delivered at the creamery and have all the children go to one school in the middle of the township. Have a teacher that is able to carry on an experiment station, who knows the names of all the trees planted and can teach the children all about trees and shrubs. Our ordinary teacher could not teach the boys the names of those trees. We have got to get another crop of teachers before we are able to tell the children the names of common shrubs. I have no criticism to offer on the paper. It is a good plan to put the shrubbery on the outside of the grounds and leave an open place in the middle to be mowed. I do not think I would plant the Norway spruce, because it is not hardy out there. It is not adapted to the climate. The Norway spruce fails in many places, but I would plant the white spruce, a native of Minnesota. I would add another to the list of shrubs; some of those red twigged willows would make a very nice appearance.

Mr. Jno. Freeman: It is utterly impossible for me to keep my seat after listening to this very able paper and one so much in harmony with my best convictions. I presented a paper along a similar line to that presented by the professor this afternoon. The importance of this subject has impressed itself deeply upon my mind, and especially so since my experience in the country school district, but I would disagree a little in some respects with the last speaker on the floor. Of course, the work is great, but the step taken is a long one as advanced by the last speaker. But I believe we need something like an extensive improvement in our small country school district as at present conducted. Most of our school grounds are four by eight rods square, without tree or shrub, and until we can do better can we not strive to spend a small portion of the tax to give our children a preliminary instruction in horticulture? I

am certainly in favor of making strenuous efforts to unite anywhere from five to ten or more school districts into one. If the township is very populous make it two instead of one. I think such a movement would appeal to the voters and tax payers. Let us try to make possible this idea of a central school location where we can have our children instructed in their early days in the rudiments of horticulture and become acquainted with the beauties of nature. It seems to me a vital point to be considered by us who are tax payers. In five years our teachers will become capable instructors. I hope this idea will soon be taken up in our state.

Mr. J. S. Trigg (Iowa): I wish to say to the everlasting credit of the state of Minnesota that it possesses the nearest approach to the model school house grounds of any I ever saw. I will not name the county, but it is somewhere near where my friend (Mr. Freeman) lives. The interesting paper presented by the lady this afternoon is really too much of a good thing when you consider what most of the school house grounds in the west are. It is something too far in advance. Every man can take something out of the paper and apply it in his own locality, and what I want to say can be put into practical operation by any one.

Trees constitute the first element in the beautifying of school house grounds. The legislature of the state of Iowa absolutely requires the planting of, I think, fifteen or twenty trees in the country districts of that state. The great trouble has been that while the trees have been planted there has been no fence placed around the property to keep people from hitching their horses to the trees. The first thing I want to do is to insist that there should be a substantial fence built around the school house grounds so that no unregenerate voter can come there and hitch his horse to the trees. So first put a fence around the school house grounds and then plant the trees. This particular school house that I mentioned before is located about fifteen miles from the Iowa line. It has a bell in the tower, a few natural shade trees and a few evergreens around it and is surrounded with a four-board fence so a man cannot drive into the grounds and hitch his horses to the trees. As I ride by on the railroad I always notice that school house. The schoolma'am that teaches in that school house I know is pretty; she must be. If I was a young man living in that vicinity I would go to see that school ma'am. I know she would make a good wife for any man.

Mr. Oliver Gibbs: That was an excellent paper that the lady read, but it was way up among the clouds and sunshine of the ideal state, and I am glad to see an effort made to get down to bed rock. If you have got to keep a fence around the grounds to keep the unregenerate voter from hitching his horses to the trees what is there to prevent him jumping over the fence and cutting the young trees for whip stocks? The first thing to do is to organize a local horticultural society in every school district, and then to commence with the education of these same unregenerate voters, and when we have done that we can go ahead with our improvements.

Mr. O. M. Lord: I had the question asked nearly a year ago as to how all this beautifying that was proposed should be done, and the answer was to elect women on the school board

VARIETIES OF STRAWBERRIES FOR MINNESOTA.

F. F. FARRAR, WHITE BEAR.

It would be presumptuous for any person with a very limited experience to give in an authoritative way certain varieties of strawberries as the best for Minnesota, especially if there are many varieties that have been tried for a short time only or not at all.

In giving a list of the best varieties, the method of cultivation as generally followed in the state must be taken into account, also the object in view, whether for market or home use. It seems to be the general practice to use the matted row system, mulch in the fall or winter and give no spring cultivation, and get as many berries as possible for the market irrespective of their quality or appearance.

We doubtless have much to learn yet as to the best methods of raising berries. When soils, fertilizers, cultivation and the like are better understood, many varieties which are now discarded will be classed among the most profitable.

The general public is not so very critical about quality. Anything that is of fair size, and looks good, will sell well, whether its quality be good, bad or indifferent. Until a large number of those who buy have been educated to appreciate and demand the best to be had, it will not pay to raise some excellent varieties which require special treatment and should therefore bring a higher price to make them profitable. Until that time comes the majority of those who raise berries for the market will prefer the most productive kinds, paying but little attention to quality. The Warfield, Bederwood and Clyde are suitable for this purpose.

When people understand that there are different varieties of varying qualities, that some excel in size, some in flavor, others for canning, the man who has something a little fancy to offer will find a ready market and can afford to raise some kinds whose cultivation would now yield him no adequate return for his labor. There are signs that the discriminating process has begun, and the time is not far distant when those who have an article of extra value will be the gainers.

It is not my purpose to recommend my favorites for all parts of the state, since the diversity of soils and methods has so much influence on different varieties. A neighbor one mile away does not succeed with some varieties that do well with me, and vice versa. At the present time the Brandywine heads my list, as it is a general purpose berry, good for the home or the market. It is of large size, with very few small berries, bears for a long time, is excellent for canning, will keep for days without getting soft, has a foliage of vigorous growth to protect from the hot sun and makes plenty

of runners. It is the only variety that has never failed me and has more good points than any other variety that I have tried. However it is a little dark for some markets and is not quite so productive as desirable, yet has brought me from two to five cents per quart more than the market price of my other kinds.

The Tennessee and the Haverland have also given satisfaction, as they yield well and are of uniform appearance. The first berries of the Tennessee are somewhat misshapen, while the Haverland is a trifle too soft and too light in color. The Clyde is in the experimental stage but will undoubtedly prove a good market berry because of its size.

The Isabella gives promise of good results. The vines are vigorous and were literally loaded with fruit this year, when the drought spoiled them. The berries are of good size, a dark glossy color, and have a peculiar but not unpleasant taste. A good berry to can.

The Enhance, another dark berry, was the only variety besides the Brandywine to withstand the drought. It, however, is misshapen and too dark and lustreless for the market.

The Henry, which is said to be the Marshall under another name, is of the finest flavor, but altogether too shy in its returns. Perhaps the right method of growing it has not been used.

The Bismarck, Margaret, Ocean City, Parker Earle, Edgar Queen, Sparta, Monarch, Crescent, Bederwood, Princess, Eureka, Warfield, Mary, Beverly and Carrie have been discarded for various reasons.

The latest on trial are the Aroma, Bride, Sample, Seaford. Jerry Rusk, Nick Ohmer, Shepperd, Klondike and Ridgeway. Of these, the Sample gave the best impression this year.

One of my neighbors speaks highly of the Saunders and Barton's Eclipse, the former always doing well when other varieties fail. Had I rich, low lying land, I would plant the Bubach quite extensively.

With my limited experience I do not wish to say that such and such a berry is the best for the state. Observations from my own experience is all that I have attempted to give. There are many varieties that have not been grown by me at all, and some of these are well recommended in the state.

Each grower has his favorites and the best way to get at the relative value of different varieties throughout the state as a whole might be to have each member of the society name, say five varieties, giving them in the order of preference. In this manner some idea of the popularity of the kinds generally grown could be gained.

LAYING OUT AND SETTING THE CURRANT AND GOOSEBERRY PLANTATION.

C. E. OLDER, LUVERNE.

Currants and gooseberries are the easiest to raise of all the fruits, and if only a small amount of energy is employed, coupled with intelligent action, success is most sure to meet you half way. They can be raised with less effort, with less care and with less sense than any other of the fruits.

In the first place, I want a good, nearby, level piece of rich land, deeply plowed and thoroughly worked. Then lay off the land in rows six feet apart and with a team and plow turn out a furrow each way, making a narrow dead-furrow. Then mark the field crosswise of these furrows, making the rows four feet apart, so your plants will stand four feet apart in the row and the rows six feet apart. It would be well to plant a row of potatoes or other hoed crop to fill the space between the rows, for the first year or two.

Set the currants deep and fill well up so that the roots are well under the surface of the ground when finished, but leave the ground dishing toward the plants. Tramp the soil well down around the plants, leaving the surface loose for a mulch or dust blanket. Trim off all weak or small limbs, leaving not more than four of the strongest branches.

In setting gooseberries trim off all lower branches, so that the limbs will come well up from the ground on one strong stem. If they branch low at the surface of the ground, they will take root and spread too much and will not bear nearly so well as when treated as indicated above. This I consider essential for fruiting, and it is a great help where mildew troubles the plants as well as a convenience in cultivation. Trim the tops of the new growth occasionally to keep them in shape and for convenience in picking. Cultivate thoroughly early and late and allow no weeds to go to seed. After the second year discontinue cultivation and mulch heavily to retain the moisture and keep down the weeds. At this time there should be considerable fruit to gather.

Now a few words as to varieties. In currants we have had splendid success with Fay's, Long Bunch Holland, White Grape and Versailles. We also have Pomona and North Star, recently planted. Personally I would not pick the ordinary gooseberry for them, although I have more applicants to pick gooseberries than for any other kind of fruit, but I know of a row of gooseberries in our part of the state that I would pick, and will pick, too, some night. You can see the berries as soon as you can the leaves, large, light green or white, beauties to look at and a pleasure to grow them. I refer to the "White Queen," of which twenty bushes last

year produced seven and one-quarter bushels at one picking. We also have recently set Columbus and Red Jacket. The Houghton and Downing we have always grown with moderate success.

DARTT'S HYBRID.

E. H. S. DARTT, OWATONNA.

Dartt's Hybrid, now called Dartt, grew from Tetofsky seed and from its habit of growth is supposed to be a cross with Hislop crab. I obtained the Tetofsky about fifty years ago from Ingraham Gould, of Beaver Dam, Wis., under the name of Russian Crab. He got it

Original tree of Dartt's Hybrid.

from a man in Milwaukee who had received it from Canada. Later on it was boomed as Tetofsky. I sold J. C. Plumb 2,000 Tetofsky scions for $38. From the prepotency of Tetofsky seeds and the hardiness of its seedlings, I have no doubt it is part crab. I have planted seeds of the Dartt and have 27 grafted varieties. These apples range in size from a large crab to a full medium sized apple; some of them blight, some do not. The Dartt is a first class nursery tree; quality good. A housekeeper said I might brag it up as high as I pleased for canning purposes, and I would not get it too high. All trees and men have their weak points. I think the weakest point with the Dartt is its liability to blight. It has never blighted badly with me.

NOTICE

OF THE

Summer Meeting,

1901,

OF THE

MINNESOTA STATE HORTICULTURAL SOCIETY.

The regular summer gathering of the society will be held as usual this year at the State Experiment Station, at St. Anthony Park, on Thursday, the 20th day of June. This date is set as nearly as possible to accommodate the strawberry growers in the part of the state most accessible to the place of meeting, and with this object in view a liberal premium list has been prepared.

The order of exercises for the day will not differ materially from that of similar occasions in previous years. The forenoon will give ample opportunity to those so inclined to look over the experiment gardens and orchards and observe the changes and progress in this interesting and valuable work. Several of the professors and their assistants will be in attendance to explain the character of this work.

At 12:30 o'clock basket lunch will be spread in Armory Hall, and all attending are invited to contribute towards this festive occasion. Every one is welcome. If not a member, $1.00 will make you such, if you wish, and give you the publications of the society and a voice in its deliberations.

At 2 o'clock p. m. the regular summer session of the society will be held. A somewhat informal program will occupy the following two hours. A number of the professors connected with the Experiment Station have consented to make brief addresses to the meeting, and an opportunity will be offered to all who may desire to ask questions in regard to the work of the Station or the Farm School.

Remember that the social feature is especially emphasized, and don't forget to bring along your wife or husband, as the case may be.

Meeting of the Women's Auxiliary.—The regular summer meeting of this auxiliary society will be held at some convenient time during the day, to be announced.

HOW TO REACH THE GROUNDS.

Take the Como-Interurban electric car in either St. Paul or Minneapolis and get off at Dooley avenue, where carriages will be found in waiting to carry visitors to the grounds, one-half mile distant, from 9:30 a. m. to 1:30 p. m. Those who drive over in their own conveyances will find ample accommodations on the grounds for stabling.

Visitors should *NOT* take the Interurban car, but *TAKE* the Como-Interurban-Harriet car.

For further information address

W. W. PENDERGAST, President, Hutchinson.

A. W. LATHAM, Secretary, 207 Kasota Block, Minneapolis.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place by 12 m., to be entitled to compete for premiums.

Exhibitors competing must be members of this society and the growers or makers of the articles exhibited. The fruit and flowers exhibited must have been grown in Minnesota and must be correctly labeled.

No premiums will be awarded on unworthy articles.

FLOWERS.

	1st prem.	2d prem.	3d prem.
Collection of outdoor roses, six blooms of each kind shown	$3.00	$2.00	$1.00
Collection of peonies, three blooms of each kind shown	3.00	2.00	1.00
Bouquet of garden flowers	1.50	1.00	.50

FRUIT.

(One quart of each variety.)

	1st prem.	2d prem.	3d prem.
Collection of strawberries	$4.00	$3.00	$2.00
Each named variety of strawberries	.75	.50	.25
Seedling strawberry never having received a premium from this society	3.00	2.00	1.00
Each named variety of currants	.75	.50	.25
Each named variety of gooseberries	.75	.50	.25

VEGETABLES.

	1st prem.	2d prem.	3d prem.
Collection of early vegetables	$3.00	$2.00	$1.00
Head lettuce, 4 heads	.50	.25	....
Asparagus, 1 bundle	.50	.25	....
Peas in the pod, ½ peck	.50	.25	....
Rhubarb, 6 stalks	.50	.25	....

Secretary's Corner.

NOTICE OF SUMMER MEETING.—Did you see it? You will find it in this number of the Horticulturist. Be sure and come to the meeting—with a plethoric lunch basket—and some fruit, flowers or vegetables to help out in the display. See premium list.

APPLE SCIONS FROM RUSSIA.—A consignment of apple scions has just been received from Vacklav Niemetz, of Ruga, Russia, of varieties which in the judgment of the sender may prove of value here. Prof. Green, of the Central Experiment Station, has taken charge of them and will make a test of their value and report results.

SEEDLING CHERRIES AT THE EXPERIMENT STATION.—"I have succeeded in getting about a thousand seedling cherries from last year's seed. I intend to make quite a point of this growing of cherries from seed, as I think the opportunities of getting something more valuable than anything we now have for Minnesota are very good."—Prof. Green.

NOTE FROM OWATONNA TREE STATION.—"Tree station work is progressing finely. I have the same trusty man that has been with me for these many years. We are putting in over 100 new varieties of seedling apples, many of which are winter and of crab origin. My health permits me to do more business than ever before."—E. H. S. Dartt, April 30, 1901.

AMERICAN POMOLOGICAL SOCIETY MEETING.—The regular biennial session of this national organization is to convene at Buffalo, N. Y., on September 12 and 13. Our society has usually been represented at these gatherings. If any of our members contemplate being in Buffalo at that time, in attendance at the Exposition, will they kindly notify the secretary.

A PRACTICAL MUSHROOM BULLETIN.—The Idaho Agricultural Experiment Station has just published a very valuable and concise treatise on the mushroom, describing and illustrating by half tone pictures the common, edible, and poisonous varieties, describing their habits, place of growth, methods of cooking, etc. It contains what the mushroom amateur wants to know in a nutshell. Send for it if you are interested, Bulletin No. 27, to Jas. A. McLean, Director, Moscow, Idaho.

PREMIUM LIST, MINNESOTA STATE FAIR.—The 1901 premium list of the state fair is now out, a pocket edition with flexible cover. It will be found valuable reading for all who have any kind of an interest in this thriving public institution. Commencing on page 99 will be found the premiums on fruits

and flowers. Send for a copy to Sec. E. W. Randall, Hamline, Minn., if you have not already received one, and see what you can bring to this great show to help dedicate the new Agricultural and Horticultural Hall.

INFORMATION WANTED FROM YOU.—A blank circular has been or soon will be sent out to each Minnesota member of this society asking for certain information from each one. It will take only a few minutes to write in the answers to the questions asked in this circular, and a prompt and generous response will be greatly appreciated by the officers of the society. A general reply will add much to the effectiveness of the work of the society.

WHY?—"Why does the Minnesota society exclude from their lists of hardy and safe trees for Minnesota such trees as the Florence crab and Greenwood crab? At my place they take the lead of all the crabs in earliness to fruit and are strong, healthy growers, hardy and will stand most anything except the chopper's ax. Second: Why are they not propagated more? Third: There are others also as good—the Arctic and Tonka, Isham and Moulton. The Power crab is hardy but sunscalds more than those named." O. J. HAGEN, Red River Valley.

A WORD TO THE WISE.—"Warn your readers to let the high priced Winter Banana apple tree alone; grafts all killed out last winter. Ditus Day and Phoenix No. 50, from Dartt, wintered finely. I am working the Lounsend, a new blue Wisconsin plum; it has proved very hardy at Baraboo.

"I received some strong evidence of my top-working theory from Minnesota the other day. An apple grower informs me that a Wealthy tree grafted on a Transcendent stock twenty-five years ago bore five barrels of apples last year. I put in 1,000 grafts this spring in Virginia and Hibernal."—A. J. Philips, West Salem, Wis., May 4, 1901.

THE WORLD'S FAIR DIPLOMAS AND MEDALS.—Nearly eight years ago certain diplomas and medals were awarded to Minnesota by the Columbian Exposition for fruits displayed there under the auspices of this society. To-day, as the result of much correspondence, they have at last come to light from the vaults of the State Historical Society, still in the original packages, and have been transferred to this society as the proper custodian, They are four in number and are for the following articles:

1. Collection of Grapes.
2. Small Fruits.
3. Pomaceous and Stone Fruits.
4. Refrigerator.

They will be on exhibition in this office hereafter.

NEW QUARTERS FOR HORTICULTURE AT THE STATE FAIR.—A new building is now under contract, to be completed in time for use at the next state fair, intended to furnish ample space to accommodate the two closely related interests of agriculture and horticulture. Its size is approximately 240 feet long and 165 feet wide. The horticultural department will occupy the north end, and as the building faces west, with that end a short distance south of the Farmer's Institute building, the new location will not be far removed from the old. We shall need at this time probably a space about 80 feet wide by 165 feet long, the full width of the building. This will give us a little more space for the floral display as well as a little more space for the fruit tables than we have been using. To fill this space creditably we shall need the assistance of

all the regular exhibitors and a number of others who have not heretofore been with us. What have you in the way of fruit you can bring to the next state fair and help to fill up handsomely this "spick and span" new building that is to be hereafter "the building" of our fair. Very liberal premiums are offered for fruits and flowers, and you will find that there is good compensation in connection with such an exhibit, to say nothing of the larger pleasure of meeting with those having a common interest on such an occasion.

AN INQUIRY AS TO TOP-WORKING.—"May we not hear from your correspondents who have tested changing over bearing trees by either top-grafting or budding whether they find it successful and profitable at the north. Before Mr. A. W. Sias moved from Minnesota, there was a pretty extensive trial of changing over orchard trees, some in bearing and some younger, some grafted up in the tops and some in the trunks and some at the surface on E. B. Jordan's, for that day, large orchards, near Rochester, Minn. I have never heard whether that experiment succeeded. For all I know top-working by cleft grafting or budding may be considered too risky in our northwestern climate. As varieties better adapted to our severe climate are grown and more attention is paid to horticulture, grafting and budding will be more common in the west. Hurry up the hardy varieties."—F. K. Phoenix, Delavan, Wis. May 11, 1901.

Reply through the "Horticulturist."—Secretary.

"AGRICULTURAL EXPERIMENTS," A NEW MINNESOTA MONTHLY.—Under the above title, Mr. T. T. Bacheller, of Minneapolis, an enthusiastic, member of this society, issued in April the first number of a monthly journal which is to occupy a unique field, its purpose being to present to its readers the "meat," in a digestible form, of the work of experimentation now being carried on most comprehensively by the agricultural experiment stations of the country, both public and private. As every state in the Union has such a station, liberally equipped and hard at work, to say nothing of a long list of subordinate and other similar stations, there is seen to be a limitless supply of material at hand for such a publication, which if properly handled will result in large benefit to both the editor and his readers. The gentleman at the head of this enterprise is a man of push and intends to make this a success. Twenty-four pages, monthly, 50 cents per year. Address Boston Block, Minneapolis. This first number starts out with a salutatory by Prof. S. B. Green.

MASSACHUSETTS HORTICULTURAL HALL.—The new hall of the Massachusetts Horticultural Society is now completed and is to be opened the 29th of May with a unique exhibition. A local paper describes it as follows:

"The show will be one of the most remarkable in horticultural annals in that the exhibitors will be practically anonymous and the arrangement of the flowers entirely in the hands of one man, Professor Charles S. Sargent, of the Arnold Arboretum.

"The first floor of the new building will be given wholly to the flowers, which will be displayed in great masses of color, the Hunnewell rhododendrons, for example, filling an entire end of the large earth-floored exhibition hall and the rest of the room being filled with the azaleas to which Professor Sargent has given fifty years of careful and scientific cultivation. In the smaller exhibition room the orchids will occupy the centre, and along the sides, through the vestibule and in the great lecture hall there will be thousands and thousands of other blossoms."

IMPROVEMENTS AT THE STATE AGRICULTURAL COLLEGE.—The late session of the state legislature, while it failed to provide means for the construction of a main building (estimated to cost $200,000), did satisfy the other pressing needs of this institution. Prof. W. M. Hays, in a recent letter has summarized the various appropriations made as follows:

BUILDINGS:

Veterinary and live stock	$25,000
Agricultural chemistry	25,000
Girls' dormitory	12,000
Meats (curing, dressing, etc.)	7,500
Swine	3,000
Blacksmith shop (addition)	3,000
Equipment in dairy hall	3,000
For introducing agriculture in rural schools, $2,000 annually	4,000
Total	$82,500

Looking forward, he writes: "But the future will see very large growth in this institution, greater than most of us have yet dreamed of. Good work depends far more on the men than on their tools in most lines of work, and much can be done with present facilities in divisions not yet provided for. Those instructors who have new buildings provided are planning with renewed energy to carry forward good work in instruction and in experimentation.

"We are especially pleased with the appropriation, though it is small, looking toward the introduction of agriculture and nature study into the rural schools of the state. The popular sentiment of the legislature was exceedingly favorable to this department of the university, and if we can continue to merit it we shall surely secure ample means for a large institution. The national Department of Agriculture is recognizing this institution by making it a party to extensive co-operative experiments, the means for which are partly to be supplied by the general government."

DEATH OF PROF. OTTO LUGGER.—This distinguished scientist, state entomologist, and professor of entomology and botany at the Minnesota State Experiment Station for the past fourteen years, died suddenly at his residence in St. Anthony Park, Minn., on Tuesday forenoon, May 21, 1901. He had been confined to his bed for about a week but was apparently improving, and his early recovery was expected.

Prof. Lugger was a man of large attainments in his favorite pursuits and was universally held in the highest esteem. As a member of this society, he was a co-worker with us during all the time of his residence in the state, always ready and willing to assist in any way in his power in advancing the interests of the organization. In his death we have lost a dear friend as well as an earnest practical worker. A suitable obituary will appear in a later number.

THE ORIGINAL TREE OF LYMAN'S PROLIFIC CRAB, FROM PHOTOGRAPH TAKEN IN 1900, WHEN BEARING THIRTY BUSHELS. TREE FORTY FEET IN DIAMETER. THE ORIGINATOR, H. M. LYMAN, APPEARS IN THE ENGRAVING.

THE MINNESOTA
HORTICULTURIST.

VOL. 29. JULY, 1901. No. 7.

COMMERCIAL ORCHARDS FOR THE NORTHWEST.

J. S. TRIGG, ROCKFORD, IA.

The study of horticulture in the northwest may be divided into two separate and distinct branches, the one which seeks to promote the growth and production of fruit for the family, and the other the commercial aspect of the case, where fruit is raised to sell. In what I may say to you I shall confine myself wholly and entirely to the commercial side or portion.

The first thing to consider in relation to the commercial portion is that you must produce the apple and then sell it. It is a well known fact that the entire section of the northwest up to the present time has had to import its fruit, with the possible exception of a supply for a short period during the summer season. I took a couple of hours yesterday afternoon and made the rounds of the fruit men in the city of Minneapolis, of the men who buy apples and supply the trade of the northwest, and it may interest you to know the facts as to the number of barrels of apples that are bought by these men, shipped in here and distributed from this point to the interior points in the northwest. A very conservative statement given to me by the man who handles more fruit than any other man here is this, that not less than 1,600 carloads of apples were shipped in here between the first of September and the first day of February. These cars each averaged 165 barrels, or, to get at it in round numbers, there have been imported into this section of the country 250,000 barrels of apples to supply the wants of the people of the northwest. This is of interest to you as showing what you can do if you raise apples to sell. Of course, we run against the market with our summer apples and find it is glutted, and I presume many here have seen their Duchess and Transcendent crabs and other varieties of summer ap-

ples rot under the trees for want of a market. This man also told me that this demand for apples through the northwest, through this territory, is continually widening, the demand is continually increasing. This is my first point to make with regard to commercial orcharding. If you raise apples can you sell them?

The next point of interest is the price the apples bring. I am told by this same gentleman that the average price of apples wholesaled by them to the retail dealer is $2.30 per barrel. Now the apples which they have shipped in and which they sold for that money were largely produced in the state of New York—altogether, I may, say, this year. A year ago you got large consignments from the state of Missouri, but this year they were almost all from New York and consisted of Ben Davis, Baldwin, Rhode Island Greening and, scattering, a number of other varieties, a few barrels in a consignment, the three varieties mentioned largely leading. I asked this man, as I stated here yesterday, what the standing of the Wealthy apple was in this market. He told me that the Wealthy apple, whether kept in cold storage and put on the market in February or March, or sold earlier in the season not kept in cold storage, outsold any apple they could get in the city of Minneapolis put side by side with Baldwins, Rhode Island Greenings or any of those standard apples. I want you to get that into your heads, because this is a Minnesota apple, is in popular favor and leads everything now produced as a market apple that the common people want to buy to eat and cook. So I am safe up to this point in drawing the conclusion that if enough Wealthy apples can be produced in this territory to supply the demand of the territory that you are pretty safe to get from $2.00 to $3.00 per barrel for them. This point will be left so far as the commercial orchard is concerned.

From the days when Mr. Harris was going without shoes down there at La Crescent in order that he might save up enough money to buy a half dozen fruit trees until the present, it has been a constant struggle, a continued research and persistent effort to make some headway in this apple business. I want to say to you horticulturists of Minnesota that I believe the dark days have passed away. I believe we can see daylight; we know things we can do; we are more confident in our efforts brought about by experience. And while we still should keep on experimenting in the line Mr. Patten and others are doing, yet I do maintain here today that we have arrived at that point in the history of horticulture here in the northwest when it is absolutely safe for any one to plant a commercial orchard. Now, I want to make this point, that for as many as possess the proper location it is safe to do so.

Now the question is, how to do it? The planting of a commercial orchard is absolutely in itself a business. You can not stick a tree in the ground and then go off and leave it. You go out to the Pacific coast, and you will find that commercial orcharding is made a business, a science, the utmost care is given to that orchard to make it produce. The orchard is fertilized, given cultivation, everything is done in order to bring about the best result. If any man wants to go into commercial orcharding as a business he must be prepared to put in his work and pay as close attention to it as though he were raising fine stock. It is a business that must have attention peculiar to the business itself.

Where should you plant the commercial orchard? I know there is a great variety of soil and a great variety of sites and conditions. I cannot touch them all, but I will do this: I will say that I think where the best site is is on the highest point of land you have, and if you have not such a point you must grade and do the best you can. I think there are thousands of acres of land along the Mississippi river that can be planted to orchards to better advantage than any other way. That takes in only a narrow strip of country, however, so in what I have to say I will have to confine myself largely to the average prairie country as we find it in this state and in Iowa. I would take the highest parts of land I could get; you cannot get them too high. I would then go on the northeast or northwest slopes and would plant the trees north and south. I would plant them in such a way that when they get to bearing the branches of the trees in the rows running north and south would just about lap, and that would depend, of course, upon the trees and upon the kind of soil in which they were planted. I would give them plenty of air space in the rows, but have the trees act as protectors one to the other from sun scald and from the excessive heat in our summer days. I would plant the trees deep. I think the testimony brought out at this meeting goes to show that they should be planted from ten to eighteen inches deeper than they grew in the nursery.

What kind of trees would you plant to get the most money out of? I wish to confine myself to the territory where the Wealthy will grow. I hear of the Wealthy growing 150 miles north of St. Paul and doing well, and I know it will do well 150 miles south. Consequently, here is a belt of territory in the northwest three hundred miles in width that can be devoted to the growing of the Wealthy apple. If I were going to plant an orchard today anywhere within this three hundred mile limit, I should plant the whole to Wealthy apple trees. I would do it for this reason, that these fruit men here in Minneapolis told me that while the Duchess gets on the

market before the other fruits get in it is so perishable and so hard to handle that it is not advisable for a man to raise that apple with the expectation of making money out of it as he would by the planting of Wealthy. They were unanimous yesterday in their answer when the question was asked which to plant, the Duchess or the Wealthy. Every one said, "Plant the Wealthy."

What kind of a tree would you plant, how graft it? If I were going to set out a commercial orchard today I would get this kind of a tree: I would have a crab root; I would put the Virginia on the crab root and would grow it in the nursery until two years old, then I would cut off the top and put on the Wealthy. That would meet the hard conditions in this country.

After you have got your orchard planted use the forest trees as an indication how to take care of it. If you will go into the forest today where the trees grow thrifty and tall, you will find the natural condition of the soil and surroundings the very best guide to you as to how to care for your orchard. You will find the leaves making a perfect mulch over the surface of the ground. You will find the small brush, little shrubs, forest weeds and flowers growing among the trees, and there you have at a glance the conditions under which the tree, any sort of a tree, fulfills its mission the best. While you cannot reproduce that condition exactly in the orchard, you must remember that the apple is a lover of as cool weather as you can give it and as cool conditions as you can surround it with. You will notice in our orchards that the trees lean to the northeast as much as two or three degrees from the perpendicular line. The reason is that the north side of the tree is shaded and protected and consequently is cooler, and it makes the greatest growth under that condition and, therefore, leans that way. Possibly, the winds of the southwest have something to do in pushing the tree that way, but I think it is the habit of the tree growing in a cooler condition.

I told you how I did in my little orchard. I cultivated four years and then seeded to red clover, cut the clover twice a year and laid it alongside the trunk of the tree. That is the way I keep my orchard. I would keep everything out of this commercial orchard in the way of stock unless I let a flock of sheep run through at the time wormy apples fall, but cattle and other stock should be kept out of the orchard. This thing also must be remembered about a commercial orchard, that if you wish to get a good sale for your fruit you must have enough of some one kind so that a fruit buyer will be willing to come to your place and buy. If you had fifty varieties of apples in your orchard as good as the Wealthy, if you had fifty varieties and got five thousand bushels, you would not get as

much money for them as if you had only the one kind. They tell me that in order that a man may make a success of a commercial orchard he should have at least one carload of a given variety of fruit; then instead of peddling your apples in an interior town, if you have a carload of fruit a buyer will come to your orchard and pick the fruit and pay you nearly again as much as you can get peddling it out. In order to be able to sell your fruit and get a good price commercially you must have enough of a given variety of fruit to make it an object for the buyer to come to your place.

How much should the orchard pay you? The Wealthy apple will begin to bear after it has been planted six or seven years. I believe it is a fair estimate to say that with one hundred and twenty-five trees to the acre your Wealthy will pay you one dollar per tree per year; consequently, after they are nine years old—say you planted 125 trees to the acre and allowing twenty-five trees to die or kill out, leaving you one hundred trees to the acre—they will give you an income of $100 to the acre for every acre of Wealthy you plant. It may not be every year, but it will average that. I believe that is a fair, conservative estimate of the money represented in a good orchard of Wealthy trees.

Now, outside all of this experimental work that has been done I would be trying to get on the commercial side of this thing. It will pay you to go home and study it over. Look around your neighborhood and find a suitable site. You can do nothing better for your boy than to plant an orchard for him, if you live inside this belt I have spoken of, and you will not regret it.

Mr. Carl Vollenweider: When a young man talks about planting out a big orchard in whatever locality he may live in Minnesota, most people laugh at him and say he has too much in his head, that apples have been tried for the last fifteen to tweny-five years, and nobody has made any money out of them. I have studied that question for the last five or six years, and I endorse everything that Mr. Trigg has said, and I would like to find out what most of the horticulturists here present think about it. I would like to know whether they believe that in the southeastern part of the state a young man can make a success of orcharding by planting Wealthy trees, taking care of them as Mr. Trigg suggested, and whether, if he goes to work and puts out two hundred acres of Wealthy trees, invests $50 an acre in his land and buys the trees, he is going to get a return for his money equal to five or six per cent interest or more on the money invested. I would like to have all those men who think it would be a profitable investment in southeastern Minnesota raise their hands. (A few hands were raised.) There are not very many.

Mr. C. L. Blair: I have been for quite a number of years trying to grow a commercial orchard in a small way. While I would not condemn what Mr. Trigg has said, I believe by substituting the Peerless for the Wealthy it would be a grand improvement. The

apple is hardier in the first place, and in the second place it is a more beautiful apple, and it is a better flavored apple, and it will keep a month longer. That has been my experience, and I believe when I get them on the market they will be more valuable and that there will be more money in them, as the tree is hardier and better. That is what I have to say about the commercial orchard, and I commenced to grow Wealthy some time ago. I cannot give you the date of the first I set out, but I set out seventy-five as early as 1879 of the Wealthy, and my experience is that if I were going to set out an orchard I would sooner pay three times the price of three hundred Wealthy for one hundred of the Peerless if I were to use them in a commercial orchard.

Mr. Trigg: I have no desire to dictate as to what you must plant, but I simply mentioned the Wealthy because it has established itself in the market, its price is fixed, and you have got to accept the conditons as you find them today. You may have one hundred varieties that may be better than the Wealthy, but I called your attention to an apple that is called for to supply the demand.

Mr. Blair: I was simply telling what would be the effect of improvement over his suggestion. (Laughter.)

Mr. O. M. Lord: The probability is that Mr. Blair is comparatively unknown to the members of the society, but I will say that under hard conditions he grows more apples than any other man in our county, and has sold the past year a thousand bushels off his place, and his place is on our prairie with a soil different from our subsoil in the northwest; there is hardly such a soil found anywhere in the state as in that particular part of Winona county. Mr. Blair claims he has not met with good success with the Wealthy. That only illustrates what I said in my paper yesterday, that there are exceptions to all general rules.

Mr. Frank Yahnke: I would like to make a few remarks on the question that the young man raised, and I am sorry he got so little encouragement, but the reason was that his question was a little too large. If he had started with forty acres I believe he would have met with a more cordial response. I believe if a young man goes to work now if he has the money he had better buy ten acres and plant one thousand trees and take care of them, and by the time they bear he will be older and have more experience, and when those first trees bear they will bring enough to support him and give him money to buy more land. But by all means he should choose a good locality and select a good variety of trees, and I believe he cannot do much better than to use the Wealthy, but he might try some other varieties as to whether he could do better. Then plant enough to make a commercial orchard, that is, if he has got to ship his apples. If he selects a piece of land near by a home market I would advise him to plant five or six varieties; that is, to get some early varieties, get a few Duchess, get some varieties that are good eating apples at the time the Duchess are in market. He wants a first-class eating apple during the season of the Duchess. I would advise him to plant such an apple in the orchard and then plant the Wealthy and then follow with something later than the Wealthy, so he can have them at all seasons. If a man buys a piece of land near a home

market he can make his living from ten acres right from the start. He can raise fruit between the apple trees, and if he attends strictly to business he will be a good horticulturist by the time he becomes as gray as I am. (Applause.)

Mrs. L. A. Alderman (S. D.): I have been in the commercial orchard business for ten or twelve years, and I should say it would most distinctly be a mistake to plant but one variety. Our Duchess have been more profit to us than the Wealthy. We have four thousand Wealthy apple trees in bearing, and I should say it would be a decided mistake to have only one variety. I make more from my Plumb Cider than from any Wealthy on my place. I had a Plumb Cider bear fourteen bushels of apples. It is true you want a few varieties, but if possible you should aim to cover the entire season, and in planting I would advise to begin in a small way and find out what you can do in your locality. With us the Wealthy is only a moderate success on high ground, but we are in Dakota where we have less rainfall, and we find the drouth affects the Wealthy more than it does the Duchess. I do not know what Mr. Trigg would do with his Wealthy where the dealers want Duchess apples.

I find a good market for half grown Duchess. A half grown Duchess makes very good pies and sauce. We have to have apples to cover the whole season, and if in this entire territory of three hundred miles you plant only Wealthy I think you would meet with only moderate success. We find the Plumb Cider a good success and the Haas only moderate.

Mr. Frank Yahnke: When I hear the Plumb Cider spoken of it sounds to me like the wife who said "she had lost all respect for her husband when he was dead." (Laughter.) The first name is the name of the man who originated the apple. I have planted those apple trees, and I have sold some to Mr. O. M. Lord, and they are all dead. I sold some the same year, in 1873, to a neighbor, and they bore heavy crops this year. The fact is we have got to put that Plumb Cider down, it will not do on a sandy soil. The Plumb Cider wants clay soil, and I told Mr. Lord, Mr. Merritt and Dr. Wall so. Dr. Wall has got some growing, and I saw the nicest apples I ever looked at on his trees. He brought them in to the storekeeper, and he put them in the window as show apples. It cannot be grown on sandy soil, but if a man has heavy clay soil it can be made a success.

Mr. Carl Vollenweider: I realize that some of the older members here that have been experimenting and planting a half dozen trees at a time have become pretty old, and if a young man were to start in that way he would become old without doing more. I have had an opportunity to learn a little something as I am a neighbor of Mr. J. S. Harris. I claim a young man can get to a point in a short period of time where it took an old man thirty years to do and learn the same thing. A young man could not learn it if he had to try it all himself, but he has the experience of others to go on and a wider knowledge than men possessed when they began this work. It makes no difference whether a man raises strawberries or apples in a little garden and tries to supply the wants of the people, or whether he raises thousands of bushels and supplies three or four states. He sells them locally or ships them to other points, whichever way he

can get the most money for what he produces. I can make more money out of the Wealthy, and I do not have to start out with ten acres. If one man can take care of ten acres, two men can take care of twenty, and three can take care of more still, and I think we have got to that point in commercial orcharding where we no longer have to experiment with it for a lifetime, but if gone at intelligently there will not be much danger of failure.

A LUMBERMAN'S VIEW OF THE FORESTRY SITUATION.

COL. W. B. ALLEN, ST. PAUL.

I rather surmised when the secretary requested me to give a lumberman's view of the situation that it was to be a confession of past misdeeds. For most of my life I have devoted the great part of my time to the destruction of forests, and for that course I do not have any particular apology to offer. I place myself with that vast multitude of people, whether they are called lumbermen, woodsmen or farmers, that for the last two hundred years have been devoting themselves to the destruction of forests. The pioneers of our country who commenced on the Atlantic coast and advanced through the dense forests up to the Mississippi Valley axe in hand would have very little sympathy with anything that looked on the sentimental side of forestry. They were absolutely bent upon destroying forests so far as they could, and that destruction has had in view the removal of trees. They were obstacles to be gotten out of the way. They were obstacles they considered as one of their worst enemies, and the woodsman, for two hundred years past, has been employed in destroying the forests of America. So far as that destruction has inured to the benefit of the people, these axemen have been doing a good work for this country. They have opened up the forest, planted their crops, built their towns, planted orchards and put in place other trees, as this horticultural society has been doing, that are more beneficial than those that have been destroyed. I regret the destruction of many trees in the middle states, especially, that would now be valuable for timber. The same thing can be said in regard to the destruction of pine trees to a large extent. Every pine tree that has gone into the building of a house, the improvement of a farm or otherwise in this great country has contributed its share to the progress of civilization; therefore, I do not hold anything against the lumbermen, and I do not appear to defend them at this time. I still claim I have nothing to apologize for, having been a lumberman most of my life.

The general view of most of our people is still that the tree that stands in the way of anything else, that a tree growing where a hill

of corn can be planted or where potatoes can be planted is something to be rid of. I will admit that. But there is a large tract of country covered by trees that if those trees are removed is absolutely useless for any other purpose, and it is those trees that we lumbermen to a great extent have been removing. Aside from what the benefit derived from those trees has been to the people, enabling them to build their houses, and build them in a manner they could not otherwise have built them, all this territory has been a marked contribution to the civilization of the United States. If we were to consider for a minute what would be the result if we had to depend, especially on the prairies of this western country, upon the use of stone, brick or even hardwood in the construction of buildings, we could at once see the immense benefit the easily worked and tributary white pine is to the country in the western states, saying nothing of the eastern or middle states—yet there is a tendency to charge the lumbermen with some blame. There are some epithets thrown at them, they are charged with reckless destruction, unthinking greed, but as far as lumbermen themselves are concerned they have been simply middlemen, in one sense servants of the people who have demanded this destruction. Instead of saying unthinking greed, if there has been an unecessary destruction of pine trees, I would say it was the unthinking demand for lumber that caused the unusual destruction. The forests have been stripped for the benefit of this generation and to the detriment of future generations, but this work has been done unthinkingly, it has been done at the demand of you horticulturists, you farmers and dwellers in the towns and cities of the country, who have demanded as far as you could obtain it a cheap building material, and the lumbermen are no more to be blamed for this work than the axe in their hands could be blamed.

Still, laying the question of the past aside, it is my belief as a lumberman and a member of this forestry association that something more should be looked into than the wants of the present generation in the matter of forestry. We could strip the forests off of the northern part of Minnesota, and the effect would probably not be felt in this generation. We would notice, perhaps, that our lakes were getting lower, our streams were drying up, there might be some increase of epidemics, some unsanitary conditions we would notice, but the great blow would fall to future generations. It is for that reason that I think the time has come when not only lumbermen but all good citizens should give greater attention to the forest question, and from a personal lumberman's view of the situation I present it as it is now.

In the first place, the only step that has been taken in forestry in this state, and almost in any state in the United States, has been to preserve what is left from fire. It is a fact that in the cutting and slashing of the ordinary way of lumbering that fires destroy a good proportion of the timber. I do not believe it destroys as much as the woodsman cuts down; in some portions of the country it is true, but as a general thing it is not true. Forest trees that are full length are usually pretty safe from fire, especially if any work is done in that immediate vicinity. But the fire protection of the existing forests is a personal, pressing question, and the state has done as much as it could do to prevent fires. The state law for the protection of forests against fire has been in operation for several years, and the results have been good as far as there have been any results at all. The work has been handicapped for the lack of funds. The appropriation is a small one, but probably as large as it ought to be. The fire protection, therefore, can be considered as a question for the people to waken up to, and it is a question for the lumberman to consider as well as any other citizen. I lived for a great many years in the forests of the north, and the question of fire was what interested me more than anything else, and there were times when I doubted it was my duty to live any longer in that country with my family, which was liable to destruction and my home liable to be burned down by a forest fire. This is the first consideration. There is another thing which I think has been considerably agitated, so it has taken hold on the public mind, and that is interesting the United States to inaugurate upon its lands a system of forest propagation and protection. The first real attempt made in Minnesota is the step now taken to set aside and make a government reservation upon true forestry principles. This is an important step. I think that will fail.

And now I come to the only thing my brother lumbermen would differ from me in, and that is that this work of interesting the United States to make appropriations to place certain of their government lands under forestry protection will never go forward until it is understood and impressed upon our legislators at Washington that there are certain parts of the public domain that should be absolutely withdrawn from the market. That touches lumbermen right at the heart, the withdrawal of timber from the market. I have been somewhat interested since receiving this invitation in the fact that during the present fall, commencing, I think, in October, there has been a steady pressure brought to bear upon the authorities at Washington to put more and more of the timber lands of the United States on the market, and the result has been indicated

from time to time by the newspaper slips that I have cut out now and then, and which I will read to you, of the immense amount of timber land that is being thrown open to the public having forestry advantages. There is no objection to anybody cutting down their timber, and there is abundant reason why private owners should cut that does not apply to the United States. I therefore give it as my belief, from my knowledge of the frontier of the north country, that the United States should withdraw all its timber lands from the market. What has been the result this fall? (Reads newspaper clipping stating that pressure has been brought to bear upon the government to place certain of its lands upon the market under the dead and down timber act.) That is the first step, pressure brought to bear upon Secretary Hitchcock under the action of the dead and down timber act to throw open to the forestry method of lumbering, which is carried on by all lumbermen, causing the destruction of that much forest, lands the title of which should be presedved in the United States or for the Indians who own it. The theory is, of course, that the Indians need the money and that the timber would be destroyed if not cut this winter. There is no doubt but that the Indians want the money, whether they get it by cutting off the timber or any other way, but there is no danger of destruction. The claim that this timber will deteriorate so it is worth little if not sold this year has no bearing with me. The idea of the forestry people, which in my opinion is the correct idea, is to reserve the timber if necessary, and if necessary to buy it of the Indians upon a fair estimate to be made by commissioners and reserve that money so that yearly those Indians will get some good from that timber, and under the restrictions of the government to see that the mature timber is cut and put upon the market. It will not have the effect of cheapening the timber, and that is the objection the public have.

The fact is that the principal objection to the scheme of the reservation of timber upon the Leech Lake reservation, which is a large and thrifty body of timber, comes not so much from the lumbermen as it does from settlers in the immediate vicinity who would profit by the operation of cutting it, and from the settlers on the prairies in the west who think that any such act would have a tendency to increase the price of lumber, and the selfish objection from the tradesmen who sell goods to those who would market this timber. Up to within a recent period the impression was that the sale would not be authorized this time. That is where their work has come in. What has changed the idea of the Secretary of the Interior I don't know. I do not think that pressure, whatever it is, is a legitimate pressure. It is certainly not one that the people of the

state of Minnesota should favor. Here is another item dated Nov. 21st. It states that 140,000,000 feet of pine timber on Indian reservations in Minnesota will be placed on the market; that means this winter. Now 140,000,000 feet of pine timber is a great big lot of timber, and placed on the market under such circumstances would utterly ruin that reservation for park purposes. As I have already indicated, the plea is made that the Indians need the money, but such money would be spent in a short time, and the Indians would be no better off than before. The other intimation in regard to the fact that the Indians are pressing for this and that the Indian favors it show where the influence comes from. That is not all. Here is a slip dated Nov. 27th: "The sale of pine on the ceded portion of the White Earth reservation is 100,000,000 feet, and one-third only is sold." Add that 100,000,000 feet to 140,000,000 feet and you have 240,000,000 feet that has been offered to the lumbermen, and they would be fools if they would not accept the offer, this timber to be cut largely this coming winter and certainly during the next three years. That pine stands almost without exception upon land that is non-agricultural. I claim that the next step of the friends of forestry who desire to keep the forests of this state for generations to come is to bring such pressure to bear upon their members in congress as to influence them to have the destruction of 240,000,000 feet of timber a year stopped.

That is a lumberman's view of the forestry situation. It is, of course, not necessary for me to say that this timber in feet represents a large acreage. In many cases that timber is scattering, and although it is mere guesswork to say how much, I would venture to say that with the timber that has been sold by the state added to this, that at least 300,000,000 feet of timber will be placed by the state and national authorities at the mercy of the lumberman's axe this winter. I don't believe in that. I know that private owners of timber do not sacrifice their timber for fear it will burn next year or the year thereafter. Private owners are buying this timber and letting their own stand, which is just as liable to burn as that of the government. So I say the government ought to keep it until a forestry plan can be formulated in this country; I do not mean a local plan, but a plan for the entire United States, a plan similar to that adopted by foreign countries, and meanwhile this land should be holden for future generations until a system can be adopted so they can be cut systematically and benefit the people for ages, as the forests of Germany have benefited the people of that country.

I presume in saying this much, I have not shown myself a very good lumberman, but I claim I have spoken on behalf of forestry,

and I am interested fully as much in that as in lumbering. We are not practical in a great many things in this country. In some of those foreign countries a farmer owning a piece of woodland is not allowed to cut it off unless he can satisfy the authorities it would be more valuable as farm than it is as timber land. A man would be foolish to cut down his timber if it were more valuable for that purpose than for any other. Fires are started, and a great deal of timber is destroyed by farmers themselves in clearing and endeavoring to clear the land for crops, and in hundreds of cases those same farms have been abandoned afterwards and have grown up to brush and weeds—but it would not be consonant with our institutions to deny a man's right to use his private property in his own way.

There are certain tracts of timber in this state and in other states, in Wisconsin, Michigan, New York and Maine that are of no practical use for agricultural purposes. They are just as good for the growth of trees, so that private owners could afford to hold them for future use just as well as they can for agricultural purposes. The government can hold them, there is no tax to pay. We can hold them to use for ourselves and posterity, and it is our duty, from my point of view, to insist upon this being done.

AGRICULTURE IN OUR RURALS CHOOLS.

PROF. WILLET M. HAYS, ST. ANTHONY PARK.

I am exceedingly proud to follow these able and progressive ladies, these women who, unlike the women of a generation ago, are taking hold of these larger public affairs and are exerting an influence which is having an enormous and wonderful effect upon our civilization. I was impressed by the accounts of the work that is being done by this league of women as presented by Mrs. Hamlin of St. Paul. I was much pleased with what my good friend, Prof. Sanford, said about our forests and her faith that they can be in part saved. But how are we to bring about these results? We lack the people; we lack the public sentiment. We must get at the children that the next generation may be better ready for these improved methods, and to reach these youths we must get at the teachers who teach them. We can reach our hundreds in the college of agriculture and in the school of agriculture, but to reach the hundreds of thousands we must teach in the public schools of the state. The question is, how shall we build up the common home life, the country and city life of the state and nation, and how shall we beautify our cities and villages? We must teach the children of school age, must build up these subjects in our common schools.

The city is a magnet that draws the population from the country. Fewer farmers are needed from decade to decade because each farm worker can produce proportionately more than formerly. The enlarged percentage of population in the city and the lessened proportion of people on the farm is a result of economic and industrial changes, not of mere sentiment, as some philanthropists assume. It is far easier for rural people to become city people than for city children to be educated to live and work in the country. The city needs a constant supply of strong people from the country, and God pity the day when the city can no longer bring in virile blood from the country.

We must take the situation as we find it. We do not want too many people in the country, because that would mean an over production of rural products. We want only so many people in the country as will get sufficient remuneration for their work, so that the children may have the means for at least a high school education. Our city high schools lead from the farm; our agricultural high school educates a goodly number for the farm, and its capacity should be rapidly multiplied, because it makes a class of people who are really trained in the science and art of farming and farm home making. But, how are we going to get hold of the hundreds of thousands who do not pass beyond the country schools? How are we to teach the great mass of the country youth better farming and better home making? We must first modify the education of the teachers of the rural schools. If we could have one generation of rural school teachers, who, without lessening the effort for good instruction in the common branches, could teach of the farm and the farm home, the next generation of farm boys and girls would be better prepared to become teachers of the generation following them. Through our agricultural school, through our summer teachers' institutes and through other agencies, we must train a class of rural school teachers.

With the already full curriculum, and with the complaint that the common studies are not well taught, it is asked how we are going to find means of putting in more work and teach rural pupils something about their present and future life and work. In the first place our agricultural colleges are building up a wonderful body of scientific and interesting thought in agriculture and home making. The American experiment stations and the national Department of Agriculture are doing better work than those of any other country, and their literature is already rich with interesting and useful facts. What we need to do is to get more men and women who are in touch with agricultural science and agricultural education, and

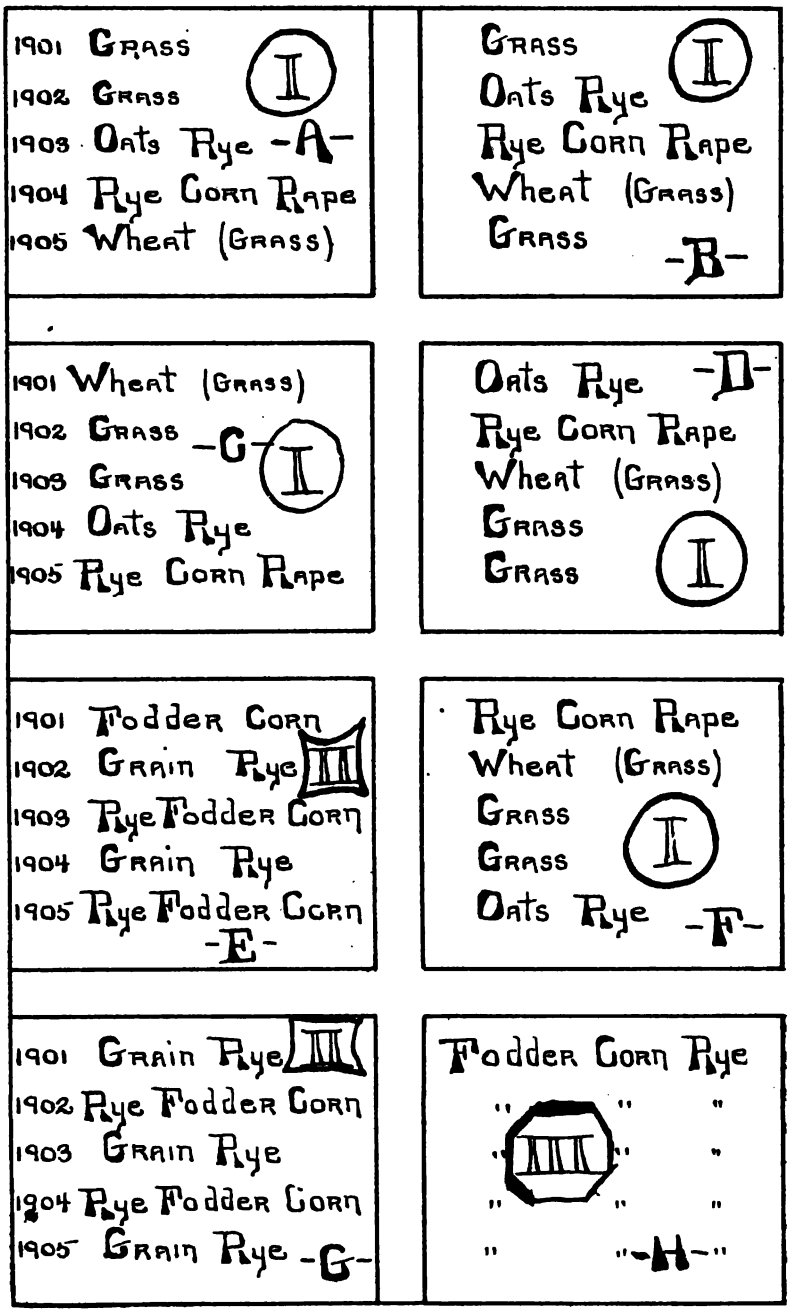
with home economics, to turn a portion of their attention to the rural school. They will be able to give us the reading books, the charts, the remodeled text books and the outlines for experiments and observation exercises which are needed.

The trained rural school teachers have an abundance of interesting material for nature study near at hand. They have the farmers' homes, the fields, gardens, school grounds, lanes and woods. If we will only educate teachers how to use their eyes and give them some helps so that they can teach their pupils interesting facts, they can start the country boy and girl on the road to an appreciation of the beauty of the country, the interests of the farm and the joys and duties of home making. We have much material that we can put into the school room. Here I have some samples of drawings of wheat and other field crops (exhibiting) which show how the flowers are constructed and how their fertilization takes place. There are no better subjects for half of this instruction than the crops of the field, of the garden and of the forest. Charts and reading lessons could be made dealing with the plants, domestic and wild animals, the farm and grounds, the buildings and the home.

The Minnesota Experiment Station has made some experiments along a line of interest in this connection. We have devised and used plans of gardens suited to the country school grounds. These gardens have been so easily and successfully managed at the experiment station that we are greatly encouraged that many schools can adopt the idea. People are apt to think of the merely interesting things, the matters relating to pure science, and the fancy things, but we can put in these gardens much that is practical as well as interesting. For example, we wish to show that some simple experiments could be carried on with field crops and even with farm management. We have succeeded in using fields only eight or ten feet square, showing the operation of a farm with its systems of rotation. The school of agriculture has found that the students do not take readily to the practice of systematic farm rotations. They have so long learned farming without system, that system in the management of fields seemed to them unnatural. But in these small gardens the principle of crop rotations is shown in a very practical way. A rural school garden forty feet square can be made to serve many useful purposes. In addition to the very small fields of the ordinary grain, forage and root crops, small plots and rows of garden vegetables and annual flowers should be in such gardens. Beside this there is room for a number of perennial and annual plants, giving to each an area two or three feet square.

Petunias	Verbenas	Zinnias	Asters	
Peppers	Carrots	Turnips	Parsnips	
Onions	Beets	Beans	Peas	
Tomatoes	Potatoes	Strawberries-Pistillate		
Cautiflower-Cabbage-Strawberries-Staminate.				
Peony	Red Cedar	Rhubarb	Asparagus	Currants
Goose-berry.	Rasp-berry.	Black-berry	Rose Wilder	Rose Blush
Golden Syringa	Golden Spirea	Golden Elder	Hyd-rangea	Honey-Suckle
Timothy, Bromus, Red Clover, White Clover				
Corn, Sorghum, Broom Corn. Kaffir Corn				
Wheat, Oats, Barley, Millet.				

Plan of garden for country school grounds.



Plan of Garden for Country School Grounds.

Note accompanying charts on preceding pages. Fields A, B, C, D and F are in a five year rotation as follows: First year wheat, with which grass seed is sown; second year grass; third year grass; fourth years oats, and rye is sown early in September on the fall plowed oats stubble; fifth year rye pastured early and plowed under for corn, rape being sown with the corn at the last cultivation to be used for late fall plowing.

By starting with wheat a year later on each successive field the five fields are used each year as follows: One field of wheat, two fields of grass, one field of oats and one field of corn; thus making a systematic rotation, each crop rotating around to each field every fifth year. A few years are necessary to have all the rotation in its regular order.

In fields E and G a two year rotation is carried on: a spring grain followed in the fall by rye; the rye is pastured the next spring and followed by fodder corn. The next two years is a repetition of the first two, etc. In field H fodder corn is grown year after year.

In the left hand chart are, first, short rows of annual flowering plants, then rows of vegetable crops. In the center of the left hand chart are numerous individual plants of perennials and ornamental fruits and vegetable crops; in the lower part of this chart are numerous individual plants of the common field crops, to be used for botanical study of their leaves, stems, roots, flowers and seeds.

Gardens planted in this manner, forty feet square, are found to be very satisfactory in size, and where all the labor is paid for such a garden costs only a few dollars annually.

The only drawback to managing these school gardens comes from the absence of the teacher and pupils during part of the summer season. Some one will be needed near each school who will assume the care of the garden during the vacation and who will consult with the teacher when there is a change from one teacher to another. Possibly this women's league can get the farm women of the state interested, and in many localities appoint women who will interest themselves in keeping up these gardens. These experiments have given us new hope in this plan of work in our public schools. If we can get all interested to work in introducing agricultural leaflets and text books into our rural schools; if we can have hung on the walls of the country school house charts relating to the interesting and important in farming and farm life; and if we can get our teachers to instruct in these nature studies, we will have in the future a greater state horticultural society and a greater state agricultural society. The introduction of agriculture and nature study

into the rural schools will bring more students into the state agricultural school and college, and will not only build up technical knowledge but will build up a better civilization on our farms and in our state.

GATHERING, HANDLING AND PACKING TRANSCENDANT APPLES.

J. T. GRIMES, MINNEAPOLIS.

I have 332 Transcendant apple trees, from which were gathered the past season 1,283 bushels of apples, an average of about four bushels to the tree. Some of the largest trees yielded over ten bushels. We had so much fruit, we were at a loss to know what to do with it. Transcendants picked green, bruised and in bad condition had been forced upon the market in such large quantities that there seemed to be no demand, and we had too many to think of disposing of them at retail. So we applied to a shipper, who sent out his inspector to examine our orchard. They made us an offer of fifty cents a bushel for one car load of 160 barrels, they to furnish the barrels and packer, and we to pay the pickers and deliver on the cars. So the deal was closed, and the car was sent out. We soon got a reply, saying it was as nice a lot of fruit as they had ever received and to send another car. We got our returns promptly in cash with the request that when we had fruit to ship, they would like to have the privilege of handling it.

Some instructions are here given to those of you who expect to grow Transcendants by the car load, or any other apples, for that matter.

In the first place, ladders must be provided for as many pickers as you expect to employ. If the trees are large, they should be from sixteen to eighteen feet long and made light and strong. The picking should not begin until the fruit is fairly ripe, that is, beginning to color up. Then everything should be ready. Drop a notice in one or two of the daily papers that you want so many boys from sixteen to eighteen years of age to pick apples, to commence at a certain time. It is wonderful how boys will turn out, more than you know what to do with, but then you can take the pick of the boys. They get eight cents a bushel for picking, which is a fair price. Some of the boys only make from six to eight bushels while others turn out from twelve to sixteen for a day's work. Each boy is provided with a belt upon which to hook a light basket, holding about a third of a bushel, thus enabling him to use both hands in picking. The fruit must not be dropped into the basket but handled

carefully without bruising, and the boy who neglects to do this is not wanted. The same precaution must be taken in filling the bushel baskets placed on the ground, which when full are taken to the packer, who is also the inspector, and when accepted a card which the boy holds is punched, so the score is kept correct. There is also a manager to see that clean work is done, to help the boys change their ladders and assist in carrying the baskets that are filled to the packers stand. No boy is allowed to change from one tree to another until the work is thoroughly done.

Barreling Transcendant crab apples.

Fruit that has fallen to the ground is not gathered up by the pickers, the most of it being bruised; but with care there need be but little dropped. There are boys and girls usually around that watch the opportunity to gather it up together with the best of the windfalls and pay fifteen cents a bushel for the privilege, so there is really nothing lost.

We will now see what the packer is doing. His outfit consists of a packing screw and table. He has also a boy to assist, who

selects the largest specimens and best colored fruit, removing the stems and placing it carefully on the stem end, covering the bottom of the barrel, which will be the top when it is opened. This is called facing the barrel and adds very much to the appearance of the fruit when opened. Some of the nicest of the fruit picked from the tops of the trees is then filled in through a sack open at both ends. The barrel is then shaken lightly to settle the fruit and placed under the lower edge of the slanting table, which is a kind of shallow box on legs, with the bottom padded upon which the fruit is first emptied.

Gathering crab apples.

It is let down carefully into the barrel over a sack apron, one end of which is fastened to the lower edge of the table and the other controlled by the left hand.

When the barrel is filled and well rounded up, the packing screw is applied and the head pressed down to its proper place and the hoops tightened and nailed, the fruit being packed so solid and firm that it cannot well be bruised in after handling. A good packer can put up about sixty barrels a day ready for shipment.

Trial Stations.

MIDSUMMER REPORTS, 1901.

CENTRAL TRIAL STATION, UNIVERSITY FARM, ST. ANTHONY PARK.

PROF. SAMUEL B. GREEN, SUPT.

These summer reports from the experimental stations are not supposed to have in them the exact data that would naturally be expected in an annual report, but they are a sort of report of progress, such as one would give to a friend in a few minutes conversation.

The season, as a whole, has been very favorable thus far, and our nursery stock and fruit plants have come through the winter in excellent condition, there being very little winter-killing. The outlook now is for a crop of strawberries, raspberries and plums. Apples will be rather light, this being the off year, but some trees have set heavily. Our cherries promise a fair crop. Our seedling beds are in as good condition as perhaps we have ever had them, and if present indications hold we shall have about 3,000 seedlings of Russian olive, 16,000 buffalo berries, 14,000 Pyrus baccata, 500 high bush cranberries, and perhaps ten or fifteen thousand seedling pines and spruces. The campus is in excellent condition, and the frequent rains have renewed the lawns so that but little artificial watering has been required. Shrubs never bloomed better, and our show of tulips, irises and peonies has been first class. The only insect that has been especially abundant with us is the plant aphis, which has infested snowballs, box elder, elm and a few varieties of plums. I have prepared some new hoop tents, with the intention of smoking our plum trees to rid them of lice, as earlier in the season it seemed as if it would be necessary to resort to some such treatment; but at present the necessity is not apparent, largely due I think to the fact that the beating rains and lady bugs have checked the ravages of the lice.

While our experiment work has been very successful, and we have closed perhaps the most successful year in the history of our school of agriculture, yet we have met with a very serious and regrettable loss in the death of Dr. Lugger, who was well known to most of the members of our society. He had been connected with the university farm for thirteen years, and his death is the first break

in our faculty circle. The writer had been closely associated with Dr. Lugger during all the time he was connected with the state university, and had come to regard him as something more than an ordinary friend. These breaks must come, and we all look forward to them, but nevertheless when they do come they find us unprepared.

EUREKA TRIAL STATION.

C. W. SAMPSON, SUPT.

Grapes and all small fruit came through the winter in remarkably fine shape. Even the apple trees that carried their leaves all winter and did not appear to have their wood well ripened up, came out all right. Strawberries look well, and a good crop is almost assured, beginning to ripen at the present time. Currants and gooseberries are well loaded with fruit. Apples are light. Plums are a full crop. Red raspberries are much better than last year on account of frequent rains. I look forward to a good crop of berries and fruit.

MINNESOTA CITY TRIAL STATION.

O. M. LORD, SUPT.

The specialty of this trial station is plums, which now promise a full crop, the fourth in succession. Eight varieties are in bearing this year that have not fruited before: Gold, Ames, Hybrid, Montana, Guilford No. 2, Mankato, Aitkin, Red June and Abundance. The curculio have not been as destructive as usual, and there is no appearance of aphis nor of plum pockets.

Plants from the university station were received of Pyrus baccata, Abies concolor, Russian olive; also McPike grape and Rathbun blackberry, all of which are growing.

Scions of the Oglesby plum, from Ames, Iowa, are growing; also some scions from Mr. Wilfert's apple seedling from Ben Davis are doing well.

Apple trees from Mr. Widmoyer, 15 M Cross, Beecher's Sweet, Rollin's Prolific and Pippin and Windsor Chief, are doing well. From C. G. Patten, 1 Greening, 1 Northwestern Greening, 1 B. D. Sweet, 1 Brier Sweet No. 2.

Strawberries received for trial are the Excelsior, from Widmoyer, and the Walker, from S. R. Spates. The strawberry crop is undeveloped, from drouth. Blackberries of all varieties promise well.

Red raspberries and black at this station are a complete failure this year, probably owing to a late growth of canes last fall.

No Wealthy apple trees are in bearing this year, and very few of any others except Florence and Virginia crab. Cherries set heavily, but many immature fruits are falling off. The Wragg seems to be least affected.

Currants are a very heavy crop. Grapes are not worthy of mention.

PLEASANT MOUNDS TRIAL STATION.

J. S. PARKS, SUPT.

Observations at this station lately have been somewhat limited owing to my absence from home at circuit court. I find, however, that a few varieties of apples, notably the Hyslop and Transcendant, have blighted badly and will lose some fruit in consequence. Although this is an off year for apples, we shall have a fair showing of most varieties, and at this time but little falling off has been noticed as was the case last year.

Plums will be a fair crop—no pockets, blight or curculio noticed thus far.

Raspberries promise bountiful crops, having wintered well. Strawberries and grapes were injured by the late frosts. All trees are making a fine growth this season. Newly set trees look promising. A variety of nursery stock from the state experiment farm is growing and looks encouraging. A few varieties of apples of last year's growth are still keeping well in our cellars, and we expect to keep some until new apples are ripe.

SAUK RAPIDS TRIAL STATION.

MRS. JENNIE STAGER, SUPT.

There is a fair prospect of fruit, as we are having fine weather. I received this spring from the experimental farm six apple trees, half dozen raspberry plants, two grape vines, nineteen bull pine seedlings, twelve cedar seedlings and a basket of plants, and from Mr. Sampson, Minnetonka Nursery, three Compass cherries and two University apple trees. I bought and planted five hundred evergreen seedlings, black spruce, Norway spruce, hemlock, Douglas spruce, blue spruce, and so forth; twenty mountain ash, six feet; seventy-five catalpas, 100 roses; also shrubs and 100 perennial plants; also fifty apple trees, two thousand strawberries, some Stoddard plums and Wragg cherries and 100 new gladioli. Have transplanted a large bed of Turner raspberries, as they do well here. Hope to give a good account next spring if nothing happens.

WINDOM TRIAL STATION.

DEWAIN COOK, SUPT.

We have to report that the trees and plants at this station were never in better condition than they are at the present time. Not a blighted or a winter-killed twig of a fruit tree on the place, and the foliage, especially of the apple trees, unusually healthy and the trees growing vigorously. The prospect is good for a fair crop of early and medium early plums. The blossoms of the late blooming varieties were caught by the cold rains and frosts and are not bearing much.

On the whole our apple orchard is bearing fully as much as in 1900, the Duchess not quite as much, but the Wealthy is bearing even better than last season and is again proving itself the king of apples. Many varieties of apples are now bearing for the first time. We have quite a number of reputed late varieties among them.

We have had plenty of rain so far. The exceedingly heavy rains on the afternoon and evening of the 15th inst. have insured us against early summer drouth.

Raspberries, both red and black caps, wintered all right, with no other protection than our trees and some snow. They are bearing heavily. No anthracanose. We are now in the midst of our strawberry harvest, and the crop is a good one. The Crescent is giving as good satisfaction as any. The Bederwood is the best all around home variety but is too soft and light colored to be generally satisfactory on the market.

Currants will be a light crop. The bunches are not well filled. Long Bunch Holland seems to succeed as well as any. The Red Dutch is not doing as well as it did a few years ago.

Most hardy and half hardy shrubs and bushes in sheltered locations wintered all right without other protection.

If one lesson has been impressed upon my mind more than another it is the great value of a good windbreak on all sides of our orchards and small fruit plantations.

Asparagus rust, which threatened to destroy this industry a few years ago and caused widespread alarm, can be largely controlled by clean culture. Use of fertilizers, spraying with bordeaux mixture, or anything which tends to produce a strong growth should be practiced. Extensive tests show that the effect of the rust is reduced from 17 to 20 per cent by careful spraying.

Summer Meeting, 1901,

MINNESOTA STATE HORTICULTURAL SOCIETY.

MISS EMMA V. WHITE, MINNEAPOLIS.

The regular summer gathering of this society was held at the State Experiment Station, at St. Anthony Park, on July 20th, as planned. Fortune, as usual, favored the association with fair skies and cool breezes, so that none who were minded to come were kept away by the elements. The attendance was large. In the neighborhood of 350 were there and took part in the festivities, for this meeting is made a festive occasion rather than one for serious deliberation.

The forenoon was passed in visiting the grounds on the part of those most interested to see the experimental work being carried on, or in attendance in the exhibition room, where a handsome display of fruit, flowers and vegetables was made. Not as many strawberries as usual were shown this year, on account of the very general injury from late frosts, but the quality of those shown was excellent. The splendid array of flowers made up in full for the decreased exhibit of strawberries.

The amount paid out for premiums was $76.50. The list of premiums awarded follows this report and tells the story in detail.

At two o'clock President W. W. Pendergast called the friends together for an informal program, himself leading in a few pleasant words of greeting. He also spoke of his experience and experiments in plum growing. Inasmuch as plums may be grown in any part of the state and almost never fail, no matter what happens to other crops, he urged the horticulturists to be experimenting in this line, and thus establish the varieties best adapted to the several parts of the state. He has some eighty varieties growing, which he has picked up through visiting the horticultural societies of the neighboring states, through correspondence with plum men and, last but not least, from the Minnesota Experiment Station. From this large number of varieties he hopes to find the best seven or eight most suit-

ed for Minnesota culture. Thus far, the Suprise, Aitkin and DeSoto seem to be the best growers and best suited, at least to his part of the state.

In the absence of Col. Liggett, who was to give some words of welcome, the members were called upon to give some accounts of experiences that might be helpful. J. M. Underwood responded by telling of his trouble with cut worms this season. A whole block of young plum trees had been practically wiped out by them, to the tune of two or three hundred dollars. So he began investigating methods of combating the worms. In some of the agricultural bulletins (which, by the way, he said should be read by all interested in agriculture or horticulture, as they contain much valuable information, and so condensed that the busiest men can find time to read them,) he found suggested remedies which he tried. First, clover treated with a solution of Paris green was strewed around the trees, but without much effect. But another mixture of bran and Paris green had been eaten quite readily by the worms, and they were greatly thinned out. In talking with Mr. Elliot of his trouble, the latter offered to give him a remedy, which proved to be the same as already tried and found helpful—Paris green and bran—but sweetened by the addition of molasses.

Following Mr. Underwood, Dean Liggett, in his hearty and genial way, welcomed the horticulturists and made them feel perfectly at home at the agricultural school, assuring them of his hearty appreciation of the encouragement and help they had always been to the school, and of a continued welcome if they would come year after year for their summer outing.

Prof. S. B. Green gave an interesting review of the work of the agricultural school and station, speaking somewhat as follows:

"I came to this school and station in 1888. Since then the horticulturists have had their annual summer meetings here, with one or two exceptions, making this their twelfth or thirteenth summer meeting here since my connection with the faculty. In looking back to see what has been accomplished in this time, I recall that there was not a student in the school of agriculture in 1888; the very name of "experiment station" excited wonder. We finally established a class, which numbered twenty-seven pupils. But this effort was only a little thing away off in a corner, a byword, and looked upon with almost contempt. We have grown from nothing in 1888 to an enrollment last year of 541 students. I remember of saying to some one at that time that my idea of the work of an agricultural college was that it should turn out men who would go onto the farms, and the glory of this institution would consist in the number of boys sent out into the country and onto the farms. The Minnesota agricultural school has signally succeeded in this direction.

I know that in point of excellence the agricultural department of the University of Minnesota is ranked higher than any other department of our university. I have visited the principal agricultural schools and colleges in this country, and I know they have to work hard to get students, and comparatively few of them go back onto the farms. We do not have to work hard for this, for our system educates that way. I have visited also most of the principal European agricultural schools and colleges, and I do not know of one that I would rank higher than ours, or one that I would rather belong to than to the faculty of the Minnesota agricultural school. Minnesota is good enough for me.

"The first faculty consisted of Professors Porter, Hays, Sprague and Harper and Dr. Lugger and myself. There have been a few changes and only one death here, which we have recently experienced in the great and untimely loss of our friend, Dr. Otto Lugger. These men with others who have joined with them have made this school a splendid success. They came here for their life work, and they recognize that their lives are not going to be long enough to make this work as great a success as it should be. They feel that the work is immortal but the workers are very mortal.

"People come here and see our fine buildings, the dairy building, the horticultural building, the armory, the girls' building and others, and our fine grounds, and they say nature has done much for us—but we have done something to help nature. We have tried to imitate nature as she appears at her best, and this natural appearance of our campus is the result of a great amount of work and care. At first there was no highway or graded road where is our present entrance. We came across the fields to reach the institution. So our buildings have increased in number, (and we are soon to have additional ones) and our grounds have grown in beauty, and the work of the experiment station has grown in greater proportion; and our school has surpassed all that was thought possible, until we are looked upon throughout the northwest as having an ideal institution; that is, the stone that was rejected of the builders has become the head of the corner.

"Last winter the legislature made an appropriation of $2,000 a year for the purpose of sending agricultural literature from the school of agriculture to the rural schools. The idea is to give a start in rural education in agriculture. Short bulletins on subjects of special interest will be prepared and sent to all the district schools. This is a movement that will result in great good, for it is of no use for the legislature to pass a law requiring the teachers to teach something of horticulture or agriculture in the public schools when they do not know anything about these subjects themselves, much less how to teach them. I believe great good will come from these pamphlets sent out, so that the teachers will know what and how to teach horticultural or agricultural topics. When the work is better known there will come to be a demand for it, and it will become an important qualification in teachers."

Prof. Snyder, of the department of chemistry, was next called upon and read an able and practical paper on "Plant Foods for

Horticultural Crops," which will appear later in our monthly. (See index.)

Prof. T. L. Haecker, of the dairy department, spoke of the dairy interests of Minnesota. "Modern dairying in Minnesota," he said, "extends over a period of only about ten years. Prior to 1890 there was no real commercial dairying in the state. I made a trip throughout the state in 1891. I found no good butter being made in factories at that time. The butter was chiefly noted for its variety. The cream was raised, some in cellars, some in kitchens, some in tanks in barns. This was gathered and carried sometimes twenty or thirty miles, and it was poor stuff by the time it got to the creamery. Butter makers then were not trained men. I did not find a single factory then that was clean or fit to make butter in. The result was a general dissatisfaction. The farmers were dissatisfied, the butter makers were poorly paid, and the creamery men could not get good prices. There were one or two instances of cooperative creameries where separators were used, and these were giving satisfaction. These have multiplied until now we have about seven hundred of these modern creameries. In fact, the growth has been almost too rapid, and some creameries have been built where they were not needed, and a few creameries are idle because they were built where they should not be.

"Some one at one of the farmers' institutes asked why Minnesota made such good butter. This may be answered by asking why the butter of Faribault county is so different from that of an adjoining county. At the farmers' institutes in Faribault county we have had large gatherings, while in the adjoining county we could not get an audience. This will explain why Minnesota as a whole makes such good butter.

"The past year the cash receipts to the farmers, after defraying the expenses of the manufactory, the net returns to the men that produced the milk, were between eleven and twelve million dollars. We also have an income from the private dairies of about five million dollars, and these, with income from other sources, bring the returns from the dairy interests of the state up to about $20,000,000.

"No small results from the introduction of modern dairy methods is the relief to the housewife. It is often thought that the south part of the state is especially adapted to dairy interests, but I think the time is coming when the central and northern parts of the state will do more work of this kind than is now being done in the south,"

Prof. M. H. Reynolds, veterinary surgeon at the station, gave a short talk on recent developments in medical science, especially as pertaining to veterinary practice. As it is

possible now to make diagnoses of diseases of man with a certainty and positiveness that were impossible a few years ago, and as the art of prevention in such diseases as diphtheria and smallpox by means of vaccination and other wise has greatly improved, so an equally great advance has been made in the knowledge and prevention of diseases of animals. Black leg and other diseases for which it was formerly thought nothing could be done can now be prevented with great certainty. Texas fever has interfered greatly with cattle traffic, but this problem is almost solved. It has been found the disease is possible only in the presence of a certain tick. The cure for this is to give the southern cattle some treatment before they leave the south that will kill the tick. The only difficulty is to find something that will kill every tick without injuring the cattle. But work is progressing along this line. A serious proposition with cows is milk fever. We now have a treatment that will cure 96 or 97 per cent of such cases. Five years ago we would not have thought of treating the disease. We are getting on positive ground in the diagnosing, prevention and treatment of diseases of animals.

Prof. Thos. Shaw, of the live stock department, in response to the president's call, said he should talk on horticulture, not because he knew much about the subject, but because he knew so little and wanted to learn something about it. He first paid a compliment to the horticultural society, expressing his surprise to learn of its nearly 1,000 members and of its first rank in size of all kindred societies of the country. He gave warning that he should study its methods with a view to make the Live Stock Association, of which he was an interested member, its rival in membership. Prof. Shaw's talk was bright and breezy, and hinged about three questions which he propounded as follows:

Recounting his own failure in getting a crop of strawberries from a most thrifty looking bed because he had planted varieties that were not self-fertilizing, he asked: First, "Ought not persons who are sending out strawberry plants to the farmers to send out only self-fertilizing varieties. If a professor fails in his attempts at strawberry culture what can you expect of the average farmer?" Second, "Would it not be better to plant red raspberries close together in wide rows so that they would catch the snow and be thus protected in winter, rather than in the regular way of planting wide apart with the purpose of burying them in winter? The average farmer will not grow these berries if he must lay them down and cover with earth to protect the vines. If this can be avoided he

may be pursuaded to raise the berries." Third, "What can be done with black raspberry bushes to prevent their being blown by the wind?"

Mr. Underwood suggested that the laying down of raspberry vines was just as practicable as any other part of the average farmer's work.

Prof. W. H. Cole, superintendent of public schools in Huntington, W. Va., who was visiting Dean Liggett, an old time friend, expressed his interest in the program of the afternoon, and told of his surprise at the development of this northwestern country, where he had been taught to believe no one could ever prosper, and spoke in words of praise of the great agricultural institution he had found here under the fostering care of his old friend.

The following resolutions of respect for the memory of the late John S. Harris were presented by Mr. Clarence Wedge:

RESOLUTIONS IN MEMORY OF JOHN S. HARRIS.

Resolved: That as citizens of Minnesota we wish to express our appreciation of the great benefits our state has derived from the life and labors of our departed brother, John S. Harris. While in more conspicuous places others may have made more brilliant records for public services, it may well be doubted if any man has added more to the resources of the state, the comfort and beauty of its homes or the happiness of its citizens.

As northern horticulturists we deeply realize the burden of gratitude we owe to a leader and fellow worker whose courage never faltered, whose industry never flagged, who labored faithfully in season and out of season to lay the foundations of horticulture in this new, needy and seemingly uncongenial soil. Others have had a large and honorable part in this work, but without any disparagement of their labors we easily agree that no other hand has been raised so long, so earnestly and so effectively in behalf of every department of our art. Our gardens have a richer color and a sweeter fragrance from his touch; our sheltering groves whisper his cherishing; our orchards droop with a more beautiful and luscious fruitage in perpetual memorial of his life.

As members of this society we would recognize the one chiefly instrumental in its founding, and for thirty-five years its most active, regular and useful supporter. Repeatedly honored with the most important offices within our gift, he rather did honor to these offices and to the society by his earnest and unselfish use of them to further its beneficent ends.

As friends and associates we would at this time express something of that love and esteem that we all feel for one whose life of genial kindness was a constant benediction. Verily did he follow in the way of his Master, in that "He came not to be ministered unto, but to minister." We shall miss him now for many days. There is no one to fill his place. Indeed, no one can ever fill his place in our

hearts and in our councils. But we shall cherish his memory as one of those whom we shall hope to meet and greet again,

"When the sins and the sorrows of time shall be o'er,
Its pangs and its partings remembered no more."

These resolutions were adopted by a rising vote.

Similar resolutions pertaining to the late Dr. Lugger were presented by Mr. J. T. Grimes and similarly adopted:

RESOLUTIONS IN MEMORY OF PROF. OTTO LUGGER.

Whereas, It becomes our solemn and painful duty to record the death of our brother, friend and co-worker, Professor Otto Lugger, of the Department of Entomology and Botany in the College of Agriculture of the University of Minnesota, which occurred May 21, 1901, in the 57th year of his age—revered, honored, loved and respected by all.

And whereas, In the loss of Dr. Lugger this society is deprived of one of its most valuable aids in defining the habits of both insect and plant life, so as to distinguish our friends from our enemies in nature; and the bulletins which he issued from time to time on those subjects are regarded everywhere as of undoubted authority.

And whereas, His name has become a household word in many of our homes. Though unassuming and retiring in disposition, his manner was most genial and cordial. A man of profound learning in the science of his profession, he was ever ready to impart that knowledge which he had acquired to those around him. How much this society, as well as the state at large, owes to his labors, can never be fully known.

Therefore, Be it Resolved, That we bow in humble submission to the Divine Will, believing that our loss is but his gain, and that he has only been removed to a higher sphere of usefulness; and while we cherish his memory, let us also try to emulate his virtues.

Resolved, That we will ever hold in remembrance his patient work and perseverence in the research and development of useful knowledge, and that his zeal will stimulate our efforts to perform our duties in our several callings with like honesty, fidelity and truth.

And finally, Resolved, That our secretary be instructed to forward to his bereaved family, in this their hour of deep affliction, our warmest sympathy, together with a copy of these resolutions.

It was also voted that copies of the above resolutions be presented to the respective families of the deceased.

Wyman Elliot, on behalf of the executive board, presented the name of A. K. Bush, of Dover, as worthy an honorary life membership in the society on account of the faithful work he had done in its interests, and moved that this honor be conferred. The motion was unanimously carried.

J. M. Underwood had a few words to say about the new horticultural quarters at the state fair grounds. A new building costing $25,000 that is to accommodate both horticulture and agriculture

is in the process of erection. It is 160 feet wide and 240 feet long, and covers a space four times as large as the old horticultural quarters. Mr. Underwood urged the importance of every horticulturist rallying to the support of the exhibit that will be made there next fall, that it may be the most attractive display of its kind ever made in the northwest. As much of value may be learned in the six days of the fair as in a year, perhaps, in days gone by. Premiums are liberal, bring your apples, or anything mentioned in the premium list, and win all you can.

Mr. Elliot suggested that any especially nice specimens of strawberries, or other fruit too early for the fair, be prepared in cans and brought in for exhibition.

The exercises closed by the reading of an interesting paper—a prose poem it might be called, by J. T. Grimes, on "The Army of Flowers," which is given in full elsewhere in our monthly. (See index.)

The hour for dismissal having arrived, President Pendergast declared the meeting closed.

AWARD OF PREMIUMS, SUMMER MEETING, 1901.

STRAWBERRIES.

Article.	Exhibitor.	Premium.	Amount.
Clyde	J. R. Cummins	Third	$0.25
Brandywine	"	Second	.50
Parker Earle	"	First	.75
Marshall	"	First	.75
Princess	"	First	.75
Collection	R. A. Wright	First	4.00
Splendid	Thos. Redpath	Second	.50
Excelsior	S. R. Spates	First	.75
Walker	"	First	.75
Lovett	"	Second	.50
Bubach	F. F. Farrar	First	.75
Jerry Rusk	"	First	.75
Isabella	"	First	.75
Saunders	"	First	.75
Tennessee Prolific	"	First	.75
Warfield	"	Second	.50
Aroma	"	First	.75
Shepperd	"	First	.75
Haverland	"	First	.75
Seaford	"	First	.75
Sample	"	First	.75
Glen Mary	"	First	.75
Collection	Wm. Lyons	Second	3.00
Bradley	"	First	.75
Lovett	"	Third	.25
Lovett	C. W. Sampson	First	.75
Saunders	"	Second	.50
Bederwood	"	Second	.50
Manwell	Wm. Lyons	First	.75
Clyde	"	First	.75
Livingston	"	First	.75
Crescent	"	Third	.25

Article.	Exhibitor.	Premium.	Amount
Monitor	"	First	.75
Crawford	"	First	.75
Vories	"	First	.75
Splendid	H. F. Busse	First	.75
Brandywine	"	Third	.25
Cyclone	"	First	.75
Crescent	"	Second	.50
Bederwood	"	First	.75
Enhance	"	Second	.50
Carmi Beauty	F. F. Farrar	First	.75
Warfield	H. H. Pond	Third	.25
Crescent	B. T. Hoyt	First	.75
Enhance	"	First	.75
Brandywine	"	First	.75
Warfield	"	First	.75
Bederwood	"	Third	.25
Clyde	"	Second	.50
Cyclone	"	Second	.50
Wm. Belt	E. B. Miller	First	.75

R. H. L. JEWETT,
W. L. PARKER, Judges.

CURRANTS.

Red Cross	Thos. Redpath	First	$0.75
Red Dutch	"	Second	.50
White Dutch	"	First	.75
White Grape	"	First	.75
Victoria	"	Second	.50
Stewart	"	First	.75
Fay	"	Third	.25
Red Cross	S. R. Spates	Second	.50
White Grape	"	Second	.50
Fay	"	Second	.50
White Dutch	"	Second	.50
Red Dutch	"	First	.75
Victoria	"	First	.75
Fay	Mrs. F. L. Town	First	.75
North Star	H. F. Busse	First	.75
Long Branch Holland	"	Second	.50
Victoria	"	Third	.25
Pomona	"	Second	.50

R. A. WRIGHT, Judge.

GOOSEBERRIES.

Pearl	Thos. Redpath	First	$0.75
Houghton	"	First	.75
Red Jacket	"	First	.75
Carry	"	First	.75
Minnesota Thornless	"	Second	.50
Pearl	S. R. Spates	Second	.50
Red Jacket	"	Second	.50
Houghton	"	Second	.50
Minnesota Thornless	"	First	.75
Carry	"	Second	.50
Downing	C. W. Sampson	First	.75
Champion	"	First	.75
Pearl	"	Third	.25
Pearl	H. F. Busse	Third	.25
Houghton	"	Third	.25
Downing	B. T. Hoyt	Second	.50

R. A. WRIGHT, Judge.

FLOWERS.

Article.	Exhibitor.	Premium.	Amount.
Peonies	J. T. Grimes	Third	$1.00
Peonies	Thos. Redpath	Second	2.00
Roses	W. L. Parker	Second	2 00
Bouquet	"	First	1.50
Roses	Mrs. F. L. Town	Third	1.00
Peonies	Jewell Nursery Co	First	3.00
Roses	" "	First	3.00
Bouquet	" "	Second	1.00

E. NAGEL, Judge.

VEGETABLES.

Asparagus	S. R. Spates	Second	$0.25
Pie Plant	H. F. Busse	First	.50
Collection	Wm. Lyons	First	3.00
Lettuce	"	First	.50
Asparagus	"	First	.50
Pie Plant	"	Second	.25

J. P. ANDREWS, Judge.

LAYING OUT AND SETTING THE RASPBERRY FIELD.

ROLLA STUBBS, BEDERWOOD.

The red raspberry. One year previous to setting plants, I haul out and cover the ground with a good coat of manure, choosing the oldest and poorest land that has been cultivated. I choose a heavy clay soil or with clay as near the surface as I can get it. Then cultivate it to corn one year, keeping the ground clear of grass and weeds, and getting the manure thoroughly mixed with the soil. I usually set two to three acres at once. Then the next spring I plow my ground six to eight inches deep, harrowing the ground thoroughly and making it very smooth.

Next take a marker made like a corn marker only having runners five feet apart making three furrows at one time of crossing the field. When marked one way turn and cross the other way making five feet apart each way. As I have tried the matted row system and three by six and four by six I find that five feet each way is the best, and almost all the fruit growers in my vicinity are adopting the same plan. If grown in this way they are much easier to pick from and to cultivate, producing almost as many berries as in matted rows and a much larger and finer berry. I also find that red raspberries grown on heavy clay soil will be larger and much finer, making them more desirable for shipping.

The fall previous to spring setting, I get good plants from a two-year-old bed. Heel them in good, and they will be better than those dug in the spring. Dug in the fall they are then ready to set early in spring. I set as early as the ground will work good. After the ground is prepared as above two persons set out the plants. Take a one-horse stone boat, having on it a tub or half barrel with plants

Secretary's Corner.

DID YOU ATTEND THE SUMMER MEETING?—If not you are much the loser. Read the account of it on another page of this number and resolve to be with us another year and so on, ad infinitum, to the end. Fruits and flowers, a host of kind friends united by a common interest and a surcease of care were the lot of those of us who were there.

FROST MAY 25TH.—"Tender things such as squash, tomatoes, beans, cucumbers, melons and the tips of grapes are frozen; also potatoes and corn, but not to a great extent. I think it is hard on grape blossoms, also on raspberries and strawberries. Plum crop very small in this section, about one-quarter of a crop. Apples are fair but trees not bearing full crop."

May 25th, 1901. MARTIN PENNING, Sleepy Eye.

CHERRY WORDS—"I thought of you people yesterday when I mulched with my hands a nice top-worked tree that Dartt named "Ditus Day" when he sent me cions. My grounds, trees, last year's buds and this year's grafts never looked finer. Strawberries and fifty trees of Early Richmond cherries are well loaded and just getting ripe. Robins in abundance, and they act as if they were sole owners here."

June 15th, 1901. A. J. PHILIPS, West Salem, Wis.

WHY IS THE MARTHA A LIGHT BEARER?—"Although the bloom was light on most varieties of apples, the Martha bloomed exceedingly heavy, and the frost of May 24th and 25th entirely killed the Martha fruit stalks, whereas the Whitney No. 20, Virginia, Early Strawberry, Wealthy, Duchess, etc., were not injured at all. This may account in some measure for the complaint that the Martha is a shy or tardy bearer. Certain it is that it did not stand the frost that other varieties did." C. E. OLDER, Luverne, Minn.

INQUIRY ABOUT THE CORK BARK ELM.—"Is not the Cork Bark or Rock Elm a very desirable and very much neglected hardy northern native shade tree? Will not some of your able contributors knowing both the common White and the much less common Cork Bark Elm give your readers a comparison between the two? A Wisconsin nurseryman writes: "The Cork Bark I think the handsomest of the Elms, its leaf larger than the White Elm leaf, its seed much larger and growth slower.' "

June 12, 1901. F. K. PHOENIX, Delavan, Wis.

SURE DEATH FOR CUT WORMS.—Wyman Elliot stands sponsor for the following "sure thing": Mix one pound of Paris green thoroughly with a

bushel of bran and add a gallon of molasses, stirring together till the whole mass is "crumbly." If you can't bring it to that consistency then you have got too much or too little molasses and must change accordingly. This mixture strewed around the plants desired to protect will do the business. Try and report results.

A NEW HONORARY LIFE MEMBER.—Hon. A. K. Bush, of Dover, Minn., was without dissent elected an honorary life member at the late summer meeting. His name was recommended to the society as a candidate for this honor in recognition of his signal services to the society, notably in connection with the farmer's institute and the state legislature. He has shown himself moreover a friend and worker for the society in every possible direction, which is emphasized further by his appointment as a member of the executive board, as announced in this number.

DELEGATE TO THE AMERICAN POMOLOGICAL SOCIETY.—This national society holds its biennial session at Buffalo on September 12th and 13th. Prof. S. B. Green is expecting to be visiting the exposition at that time, and has accepted credentials from this society and will represent us at that gathering. Some of the states will have a dozen delegates there, and we should be glad of further representation if any other of our members are to be there at that time. Don't forget to notify the secretary in season to forward proper credentials.

WILL YOU EXHIBIT FRUIT AT THE STATE FAIR?—Fruit is not any too plentiful in some parts of the state this year, and the right filling up of the new horticultural quarters will require the efforts of all our members who have any thing to show. Make your plans to come early and stay late. If only one plate of apples or plums bring or send it, not forgetting to make the proper entries. Send to Secretary E. W. Randall for a premium list, and even though you have never exhibited at the fair before the directions contained therein will make the course easy to you.

THE JAPANESE LILAC (SYRINGA JAPONICA).—Amongst the items of interest to be seen at the State Experiment Station at the time of our summer gathering none was more noticeable or attractive than specimens of the above named shrub in full bloom. Growing to a large size for a shrub and covered with great clusters of creamy white flowers, very fragrant, it was a thing of beauty long to be remembered. It has moreover the imperative advantage in this climate of being perfectly hardy. Gentle reader, make haste to adorn your home with one of these most handsome plants.

VACANCIES FILLED BY THE EXECUTIVE BOARD.—A number of vacancies created by the death of J. S. Harris were filled by appointment by the board at a meeting held the evening before the late summer meeting. Hon. A. K. Bush was selected to succeed him on the executive board, Messrs. S. B. Green, O. M. Lord and F. W. Kimball on the seedling committee, and his son, Frank I. Harris, was appointed in charge of the society trial station which has been located at his father's place for a generation. The various appointments emphasize in small part only the extent of the work our lamented friend was doing for the society.

A GENUINE WINTER CRAB.—Ex-Secretary A. J. Philips, of West Salem, Wis., has growing on his place a crab, from seed planted over forty years ago, that he has at last discovered is a genuine long keeper. Three barrels of this

fruit were gathered last year, and it kept well till the middle of April, being used daily after February 1st for pies and sauce up to that time. Prof. Goff pronounces it good enough to propagate, so Mr. Philips says, and he is going to grow it and put it on the market to fill a long felt want as a real winter crab. His name for this new candidate is sufficiently unique, being called Shook Winter Crab, because the fruit kept so well notwithstanding he "shook" the fruit down instead of hand-picking it.

ANENT THE "MISSING LINK" APPLE.—An official high in the Illinois State Horticultural Society writes as follows in regard to this new variety of apple, which is at present being somewhat exploited in the northwest, (this in answer to an inquiry): "The only endorsement of the apple that I know of is that at the annual meetings a premium is offered for the 'best plate of new apples, good enough to be recommended.' The apple has been entered and received this premium two or three times, one time, I know, without any competition, and once the other competitors were ruled out because their varieties were not considered new. As you have the reports, you can find the report of the committees under the head of 'premium awards.' One party, writing from the vicinity near where it is claimed the variety originated, calls it a fraud. I do not know enough about it to express an opinion and have not found any prominent horticulturist who does know much about it. I can frankly say that I do not like the method taken to push it, and it is very evident that there is a great effort to 'work' the Illinois Horticultural Society in connection with it."

STORE FRUIT FOR THE STATE FAIR AND THE ANNUAL MEETING.—Arrangements same as for a number of years past have been made with the Produce Refrigerating Co., 410 1st Street North, Minneapolis, to receive and care for fruit stored there for either of the occasions referred to above. Any varieties of apples, plums, peaches or pears that you are willing to exhibit and that will not keep till then under ordinary cellar conditions, can be sent to this address for storage, where it will be kept in a temperature of 32 to 35 above zero, which will retain it in good condition a long time. Fruit should be picked, carefully wrapped and sent by express prepaid as fast as it ripens, and in this way the exhibitor will be able to make a full show of whatever varieties are growing on the place regardless of when they mature. It is this process which is enabling us to make such fine shows of fruit at both the state fair and the regular winter meeting of the society. No charge will be made to the person storing the fruit for keeping it, and it will be delivered at the places of exhibition at the proper time also without expense. Any contemplating exhibiting fruit should send to Secretary Latham and get shipping tags specially printed for this purpose. Send early and store everything you are able to. We want *these* exhibitions to be the "top notch."

Otto Lugger

(See opposite page.)

THE MINNESOTA
HORTICULTURIST.

VOL. 29. AUGUST, 1901. No. 8.

In Memoriam.

DR. OTTO LUGGER,

ST. ANTHONY PARK, MINN.

Died May 21, 1901. Aged 57 years.

In the death of Dr. Otto Lugger, the farmers and horticulturists of Minnesota have lost one of their ablest advisers; the agricultural department of the university has lost one of the men who have done much to make its practical education popular with the people of the state; science has lost one who loved science and who delighted in a large connection with its achievements.

Dr. Lugger had rare native ability for the work of a naturalist. Early in life he developed a strong instinct for nature study. His father, who was a scientist, wisely included in his school work a broad line of education in the German gymnasium and in the German universities. Coming to this country in early manhood, Dr. Lugger continued his studies both in university laboratories and in the field. For a time he was connected with the national geological survey on the the great lakes. Here he began a collection of insects, which was afterward burned in the great Chicago fire. About this time he became acquainted with Prof. C. V. Riley, who was then in newspaper work in Chicago. When Prof. Riley became state entomologist of Missouri, in 1868, he took with him young Lugger as assistant. Dr. L. O. Howard, Lugger's former associate in the national Department of Agriculture, and now head of the entomological division of that department, says concerning Lugger's work in Missouri,—"During the years 1868 to 1875, when Riley established his great reputation as economic entomologist and published eight of the nine annual reports which brought him lasting fame, Lugger remained his quiet, unassuming, self-sacrificing, devoted helper."

In 1875 he married Lena Rosewald and soon after became curator of the Maryland Academy of Science and naturalist of the city parks. During this time, he did much work in John Hopkins University and did much scientific work in his private laboratory. One pleasant and valuable experience was a trip to South America, in which he collected museum material for the city parks. In 1885 he was appointed assistant in the division of entomology in the U. S. Department of Agriculture. From there he came to Minnesota in 1888, where for thirteen years he held the position of professor of entomology in the university and entomologist of the experiment station and for several years had been state entomologist. The following is quoted from a recent article in "Science" by Dr. L. O. Howard:

"His first entomological experience in the state of Minnesota was one of great interest and importance, and his vigorous and intelligent action in the face of a great emergency fixed his standing as a most useful officer firmly in the minds of the Minnesota farmers. An enormous swarm of the Rocky Mountain locust, or western migratory grasshopper, had settled down in Ottertail County. By Lugger's advice and energetic field work, backed as he was by a public-spirited and intelligent governor (Hon. W. R. Merriam, now director of the U. S. Census) who personally guaranteed the funds necessary for the campaign, the hordes of destructive insects were annihilated, and great damage was averted.

"From that time to the time of his death, nearly thirteen years, Lugger's work was most active; his publications were frequent, and he gained the profound respect of his constituents and of the scientific men of the country. His bibliography, covering about thirty titles of record, comprises almost exclusively articles on economic entomology, but he was by no means a one-sided naturalist. He was a good botanist and published several papers concerning plant diseases, notably his article on the black rust (Bulletin 64, Univ. Minn. Agric. Exp. Station).

"Some years ago he began the publication of a series of large papers which, when brought together would have formed an elaborate treatise on the entomology of Minnesota. The parts which had been published were an extensive paper on the parasites of man and domestic animals (Bul. 48, 1896, Minn. Agr. Exp. Station, pp. 72-270, figs. 187, plates 16), the Orthoptera of Minnesota (Bul. 55, 1897, pp. 91-386, figs. 187), the Lepidoptera of Minnesota (Bul. 61, 1898, pp. 55-334, figs. 237, plates 24), the Coleoptera of Minnesota (Bul. 66, 1899, pp. 85-331, figs. 249, plates 6), and the Hemiptera of Minnesota (Bul. 69, 1900, pp. 1-259, figs. 200, plates 15). It is

a great pity that Dr. Lugger did not live to complete this series, since the elaborate numbers were profusely illustrated and were prepared with great care and written in most interesting style. At the time of his death he was preparing the part on Diptera, in which he intended possibly to include the Neuropteroids. It is greatly to be hoped that his manuscript was sufficiently advanced to permit its publication.

"Aside from his scientific ability, Lugger was a man of admirable qualities. His wide information, his agreeable personality and his keen sense of humor made him one of the most delightful companions I have ever known. Many of his stories and humorous sayings are current among entomologists all over the United States, and his loss will be felt for many years to come."

Dr. Lugger's public work in Minnesota forms an interesting chapter in his life's history. I remember his first public lecture, which was given before the state horticultural society in the old market hall at the corner of Hennepin and First street north. Upon the invitation of the secretary to address the society on that evening, Dr. Lugger prepared an elaborate paper on "Insect-Eating Plants." He had expected to occupy the entire evening with his lecture, and besides writing it out in excellent form he had prepared many colored drawings which he displayed before the audience. He was not called until after several others were heard, and the audience was already well tired with long sitting before he began.

His speech was then somewhat broken with German brogue, and the audience had much difficulty in following him until he left reading and began to talk about the pictures, when all were alive to the ability and to the interesting character of this new-comer into Minnesota agriculture. This speech taught Dr. Lugger that he could not interest Minnesota audiences by reading scientific papers to them, but could greatly interest them by his talks and his pictures. He developed from this time very rapidly as a public speaker, whether before his classes, before delegations of farmers visiting university farm, before county commissioners and public meetings of farmers interested in destroying grasshoppers or before any of the numerous state and national societies in which he presented scientific and practical subjects. He not only learned to talk well, but his ever ready wit and his many illustrations made of him a most entertaining lecturer. Some of the papers he presented before the state horticultural society required days and even weeks of patient labor in preparing the colored illustrations. The newspapers of Minnesota have had many interesting articles from Dr. Lugger's pen. He did not confine his scientific work nor his writings simply

to entomology, but he published many interesting things in botany. He had made a mounted collection of wild animals and birds with notes showing the relation of each to plant production.

The many kind and complimentary things which have been said about Dr. Lugger in the newspapers of the state, in private conversation and in public meetings since his death are very gratifying to the doctor's friends. It has made us all realize what a hold he had on the popular mind of the people among whom he worked.

WILLET M. HAYS.

SOME LESSONS OF THE YEAR 1900.

J. S. HARRIS, LA CRESCENT.

(Read at late meeting of the Southern Minnesota Horticultural Society, in November, 1900.)

At the early opening of last spring (1900) there was a brilliant prospect for a very large crop of fruit in Minnesota of all kinds that can be made to succeed in this climate, but in some respects the promise has not been fulfilled. The previous winter had been a comparatively mild one, and trees and plants with few exceptions had received little if any perceptible injury from cold, and those exceptions were either from root-killing in bleak and unsheltered positions where the ground was bare from snow the greater part of the winter and no artificial protection was given, or with trees that were blackened or so nearly killed in the winter of 1898-9 that they did not start into growth until very late in the season and the growth was soft and unripened. Such growth was injured by the first frost of the autumn, and such of the trees as did not come out dead in the spring have still a very sorry appearance and are only fit to furnish breeding places for insects and diseases. The lesson in this case is that such badly winter-killed trees had better be taken out, root and branch, and burned, providing they are old trees, but if they are young trees with good healthy roots they may be cut off at the surface of the ground and sprouts allowed to grow, thinning to one sprout after the first year. I have adopted this practice with the Fameuse, Utter, Walbridge and Wealthy that were killed back in the winter of 1884-5 with excellent results, having fine trees of those varieties that have fruited well for the past few years. These varieties root very freely from the scion above the stock and near the surface of the ground, and the sprouts are generally from the graft and come true to nature. Ben Davis, Wine Sap, Northern Spy and many other varieties treated in the same manner have not proved

satisfactory, and the sprouts have not been of the same variety as the original tree.

The final summing up of the season in this part of the state shows that there was harvested less than one-half a crop of strawberries, but little more than a half crop of raspberries, about an average crop of blackberries and grapes and a variable crop of native plums, while apples were generally an exceptionally large crop, much of which was lost from causes which will be mentioned later. If we can locate the causes for these facts, valuable lessons will have been learned.

Strawberries.—Over much of the state the previous fall was very dry, and its effect upon strawberries was that upon a large proportion of the plantations (particularly new ones) the runners had failed to form strong, well rooted plants, and although the bloom was liberal, owing to this cause and the drouth which prevailed last spring and continued until the season was well advanced, the plants were too weak and feebly rooted to mature a full crop of perfect fruit. Plantations that were put out very early the previous year and had made a good supply of plants before the drouth set in did much the best, which goes to show that clipping the runners off in the earlier part of the season and depending upon later ones for fruiting is not always a safe practice. Had all plantations been made early, given proper cultivation and treated to irrigation in August of the previous year, and again after the fruit had set last spring, the crop would have been better. It is said that Mr. R. H. L. Jewett, of Faribault, treated his plantation to irrigation and secured a larger and better crop of fruit than the generality of growers.

I visited a plantation at Galesville, Wis., in the fruiting season, where a liberal application of old barnyard manure had been spread between the rows, to get rid of it about mid-summer, and they were mulched for the following winter with litter from the stables because other material for the purpose was not at hand, and I never saw a larger or better crop growing anywhere in any season. This manure kept the ground moist while the plants were making their growth, and the manure winter mulching did not take up the moisture made by melting snow and light spring rains but allowed the moisture to carry nutriment to the roots of the plants. The lesson favors irrigation in times of drouth and old manure on the surface as a stimulant to growing plants.

I have not come to a final decision upon the causes of the partial failure of the raspberry crop. It did not appear to be any better where the canes were laid down and covered during the winter than

where left exposed. It is not unlikely that the roots had been injured in the winter of the previous year and, consequently, made a later growth that was not fully ripened.

The crop of blackberries and grapes came on after the drouth of this season was broken and was very fine.

Our native plums are considered to be absolutely hardy, to endure the most severe winters, and often they will stand considerable frost after the fruit has formed without injury. From the observations that I have been able to make, the variableness of the crop this season can largely be attributed to a lack of pollenization, but possibly from the frost that occurred on the mornings of the 3rd and 4th of May, when the early varieties in warm localities were in full bloom but the fruit had not been formed, and there were no insects working in the bloom to assist in pollenization. The later blooming varieties and other varieties in locations where they came into bloom a few days later when insects were plenty, set their fruit well and matured a good crop.

In the valleys along the Mississippi river and its tributaries there were but few plums, while upon the high lands, where they came into bloom a week later, the crop was abundant. I do not keep bees but am inclined to the opinion that if they were kept in or near the plum orchard the results would have been better, and if the season of blooming could be retarded a little the crop would be more certain. In most seasons jarring the trees and catching the curculios on sheets and destroying them would increase the quantity and quality of the fruit raised, but with me this season there was but little fruit for them to work on.

The growing of apples is at this time leading all other fruits in interest. The bloom of the apple trees last spring exceeded that of any previous year since 1884, and the set of the fruit was heavy. The usual June dropping was very large, but none too large for the welfare of the trees and to insure a full crop, but early varieties, and especially the Duchess and Tetofsky, continued to drop during the entire season until when fully ripe there were but few remaining to gather. As these varieties are useful for cooking, a considerable portion of them were utilized for market. The Okabena, Peerless and nearly every variety of Russian origin followed suit and were mostly off the trees by the 25th of August, but we succeeded in disposing of the most of them as Duchess without hearing of any fault found by our customers; but the windfall Russians were not wanted at any price and were not fit for converting into cider or vinegar, because they had dropped from two to four weeks before time for gathering them, and while the weather was so warm that decay set

in at once, and they could not be sent to distant markets. The Wealthy, Fameuse, Utter, Shockly, Plumb's Cider and the Russian Anisim and Antonovky hung on very well until the last week in August, when they began to drop freely, from having ripened too early, and as they would not keep well had to be gathered and marketed while prices were low to save them. The few long-keepers that are grown with us are already decaying badly, and good winter apples are scarce. The causes for this are generally attributed to the drouth of early summer, the warm rains of mid-summer that started a vigorous wood growth, diverting the sap from the development of fruit to the formation of wood, and the propagation of fungous diseases and the long-continued extreme heat that occurred during the month of August.

Some orchards, some localities and some methods of treatment brought better results than others, and it is from observations and making comparisons that we are to learn our lessons. In my own orchard scattering trees, standing in ground that was kept cultivated, did not drop their fruit as early, and two large Duchess trees carried a full crop up to the end of the season. On other scattering trees that were not thoroughly cultivated the fruit hung on longer, and it came to greater perfection than on those in full rows in the regular orchard. Trees that stood twelve by eighteen to twenty feet apart and had reached the age of sixteen to twenty years and but indifferently cultivated, ripened and dropped the whole crop earlier than those standing at greater distance apart, and decay began earlier. Trees on elevated land of clay loam or limestone soils held their fruit better, and the quality was better than in orchards on low or valley lands of light alluvial soils. Orchards on eastern and northern slopes of hills or bluffs with shelter not too close on the south and west did about as well as those on the tops of the hills, where they were not too closely planted, and were less affected by heavy wind storms. Where spraying was practiced and bands put upon the trunks as a remedy against the codling worm and apple gouger, there was a much larger proportion of the fruit that was of fair appearance and free from worms and the irregularities caused by the gouger than where these means were not practiced. In some cases where liberal mulching was applied before the soil became too dry, the results produced seemed to be favorable.

The lessons to be learned in a season like the last are: First.—That the best site for an orchard is upon high, well drained land, with strong clay loam or limestone soil or on the northern and eastern slopes of hills and bluffs. Second.—That for best results the trees should not be too closely planted. For large commercial orchards

I would recommend planting the trees twenty or more feet apart in the rows and the rows thirty to forty feet apart, according to location, and growing early maturing hoed crops between until the trees need the whole space. This distance affords better facilities for cultivation, and the roots have ample room in which to find moisture and nutrition without robbing neighboring trees—besides the fruit and foliage is less liable to suffer from the attacks of fungous diseases. Third.—Cultivation of the orchard, at least until midsummer, is better than even mulching, but probably a combination of the two or a light mulch under the trees and out as far as the branches extend might be still better. Fourth.—It is injurious to the orchard to let it become heavily sodded with grasses or to raise small grain between the trees. Fifth.—Shelter belts at a suitable distance from the orchard on the southwest and south sides are beneficial by breaking the force of winds and checking evaporation. Sixth.—Judicious spraying and methods of trapping and destroying injurious insects are a necessity in order to raise an abundance of high grade fruit.

THE ARMY OF FLOWERS.

J. T. GRIMES, MINNEAPOLIS.

When we speak of an army our thoughts naturally turn to some large body of disciplined soldiers, rushing madly forward with the force of an irresistible conquerer, carrying fire and sword, demolishing towns and cities, depopulating countries and villages and spreading on every side slaughter, destruction, desolation and want as he advances—and not the least of all the evils are the widows and orphans left behind, whose life hopes were blasted when that proud soldier went down to bite the dust upon the glorious battlefield. No more shall his smiles greet them, no more shall his arm of protection be placed about them; a life sacrificed, perhaps, more to the ambition of some proud mortal than for the sake of country or home. And what can be said of that maiden fair, no longer young in years, but wearing still the sacred pledge of future bliss that never can transpire? Could we have heard her last refrain: "Oh cruel Fate, how sad an end, to mama's hopes, and mine!" Who would envy an Alexander or Napoleon their glory when built upon a foundation like this?

Welcome to your laurels, welcome to all your glory, welcome, thrice welcome to your blood-stained garments! I covet them not, neither would I boast of having slain a brother and go to my Maker with the mark of Cain upon my brow. But enough of this. I wish it were all a dream.

We will now lay aside this image of darkness, the curse of all the centuries, and turn our faces to the light and view with more complaisant satisfaction the beauties of nature's handiwork in its development as exemplified in the formation of the great "Army of Flowers."

One who is infinitely wiser than we hath said, that Solomon, when at the height of his glory, could not afford to dress so rich nor clothe in such royal splendor as one of these humble privates in Queen Flora's imperial army. It will be interesting for us to pass in review and note the movements of this great army as they march along. Look out upon the landscape on every side, and you will see a very different picture from the one first introduced, a picture more bright, more cheerful, more refining, more lovely, one that brings happiness and joy to its possessor, a picture of the liveliest and brightest colors, drawn in such endless variety and profusion, a picture that no artist's pencil could follow in all its delicate markings.

You may well ask, whence comes this lovely picture? It was drawn by the hand of the God of nature. Who is the God of nature? Can you tell? Without the circling seasons and revolving day, this earth would be a lifeless mass of inactive matter. Whence have the flowers their distinctive individuality, in all the beauty of shade and exquisite markings? The sun darts its rays upon them and paints the spring in all its gorgeous colorings, with breath perfumed flowers the essence of the garden, and casts their fragrance to the breeze and fills our senses with feasts of luxurious delight, a feast that never cloys the appetite and in its indulgence is incapable of excess. Melancholy could scarcely exist within the atmosphere of flowers.

We first started out to review this great army, but fall back in astonishment and are lost in admiration at the vastness of its numbers, the endless variety of uniforms and perfect discipline in the order of marching. Scarcely are two columns brought into action at the same time, but column after column in regular succession, without confusion or breaking of ranks.

The flag (Iris) under which they march is restricted to the white and the blue; white being the emblem of love, peace and purity, and the blue signifying truth, loyalty and faithfulness. You will notice the red, which is a part of our own national colors and may be called the representative of blood, is left out altogether.

When the lines are formed for action the Snowdrop is foremost of all the lovely train, breaking her way through ice and snow at the moment the command is given. The next column to move forward is the Crocus, proceeding more cautiously and with some timidity, lest

some parting shot of winter should break her ranks. Then comes the Tulips, uniformed in the gayest dresses that blooming nature wears, looking more like a wedding party than a band of soldiers. Seemingly too gay to fight and yet too proud to run, they stand their ground and conquer by their attractions. The next column to move is the Carnations. More stately, more soldierly, their force is irresistible, subduing every affection with their charms, captivating every eye with a noble spread of graces and charming the senses with a profusion of delicious odors. They come but to conquer. "Veni, vidi, vici" (I came, I saw, I conquered).

I shall not attempt to further portray this wonderful army in its discipline and movements. Suffice it to say, it is endless in character, invincible in courage, perfect in order and ever ready for action when the time for duty approaches. It consists of two grand divisions, the volunteers and the regulars. The first enlist only for a season and are termed annuals and are discharged when their time of service expires. They seem to have been called into service to fill some special emergency more than for constant duty. The regulars, or main division of the army, is composed of perennials, or those who enlist during life and are more to be depended upon for constant service.

Now cast your eyes abroad! The whole plains are covered with the moving masses! Was ever an army so magnificently arrayed, in such beautiful colors and shades of color, from the purest white to the deepest scarlet, from the gayest and most conspicuous to the more sober and thoughtful? You see no two companies dressed alike in the uniforms they wear, and yet the whole procession blends in complete harmony. What an admirable arrangement in time of action, when each division is expected to perform its duty, and how easy for the one in command to distinguish one regiment from another in daring deeds of valor!

What general ever commanded so great an army with such consummate skill and military discipline? See in what order they march, company after company, column after column, battalion after battalion, regiment after regiment, in quick succession! No sooner does one company perform its duty and step aside than another takes its place, without disorder or breaking of ranks, forming, still forming, still changing, ever renewing and still executing some new design, with military order and precision, throughout the whole of the flowering seasons.

Flowers were first strewn in Paradise for the enjoyment of man alone, and none of the beasts of the field ever seem to notice, care for or place any value upon them. If there are such a multiplicity

of colors in the flowering plants, all emanating from the same soil, the same culture and the same conditions in every respect, so far as we can discern, there are no less an equal variety of scents emanating from their bosoms, every distinctive variety having one peculiarly its own. No botanist ever yet attempted to classify them or arrange into groups the different kinds of odors, or give to them certain names by which one class could be distinguished from another in the relation they bear to the plants from which the odors are extracted. Their presence can only be known and detected by the delicate sense of smell.

Some of the most beautiful illustrations of record in the Bible are drawn from the inspiration of flowers. Who does not feel their refining influence, and shall the beauties of the landscape go unheeded? Flowers are said to be the footprints of the angels, sent down to earth as messengers of mercy to proclaim peace and good will to men, and, hence, must be immortal. No artist's pencil or painter's brush could have marked out their delicate forms and perfected their colorings with such exquisite taste and finish—and their perfume, what is it but the breath of the Creator? Let me but live in the midst of the flowers, and I shall not be far removed from Heaven itself.

When I look out upon that neat painted cottage, with its well kept lawn and blooming beds of flowers, interspersed with shrubbery, all drawn from nature's hand, a living work of Art Divine, I almost envy the occupant of that home, knowing that it must be the abode of culture and refinement as well as a place of beauty and a source of delight to its possessor.

The love of flowers is an inherent principle, born in our birth and nurtured with our growth, extending through our lives and ceasing only when we cease to exist and are laid aside.

Some time ago a little girl, not more than nine or ten years of age, came to my house and said to me: "Mister, please, can I have some flowers? My father is dead." I enquired her name and where she lived, and also learned that her people were poor. So I gave her the flowers, for which she seemed to be thankful. Some little time after, she came again and said: "Mister, please, can I have some flowers? My little baby brother is dead." "Certainly, you shall have flowers to carry home to your dear little brother." But imagine my surprise, when in a little while after she returned again and said: "Mister, please, can I have some flowers? My sister is dead." "Well now, it seems to me, your family is dying very fast. I will just go back home with you, and then I will see what can be done." But like

a frightened bird she flew away, and I have seen nothing of her since.

The fact may be, that little girl had such a fondness of flowers that she would have buried every relative she had, in her own mind, to have procured those funeral tokens. I hope she may be able some day to have a flower garden all her own, in the sweet by and by.

When I enlist and become a soldier it will be in the imperial army of Queen Flora, beneath the star spangled banner of the white and the blue, where I may pitch my tent beside the *Rose of Sharon* in the *Lily of the Valley,* and when the *Trumpet Flower* blows I would fall into line and march proudly, beside the *Asters* and the *Mary Goulds,* to win the *Morning Glory* on the battlefield.

With the *Lackspur* I'd rise to the top of the morning,
To catch the first glimpse of the sweet-scented breeze,
Where zephyrs are wafting and perfumes are greeting
My nostrils, with odors of *Rose* smelling trees;
And sip the sweet nectar from the *Honeysuckles* bosom
And then take my rest, on a bed of *Heart's Ease.*
Or like some rapid growing vine
Let me but climb the skies,
And bring to earth again, my home,
Once lost in Paradise.
Then, when my *Thyme* shall expire,
I would gracefully retire;
Marching, marching, to the music of the *Canterbury Bells.*
In the garden of the gods,
Lay me down among the sods,
And in memory *Forget-me-not,* sweet *Immortelles!*
Then may the *Bleeding Heart* in anguish,
Mourn the loss of a comrade so brave;
And the *Weeping Ash* in deep sorrow
Shed bitter tears over my grave!

Beautiful Buffalo Berry—This attractive shrub belongs to the olive family. It blossoms early, has a foliage of satiny silver and besides bears enormous crops of fruit fully equal to the currant. It is sometimes called the winter currant, as the berries often remain on the bushes until January. The shrubs are of two sexes, consequently should be planted in clumps or hedges, so that all the blossoms will be properly fertilized.

Where the common currant fails because of lack of moisture they frequently succeed. The blossoms and fruit of this handsome plant make it very attractive. It is suitable for decorative purposes about the home, and as it is very thorny it can be used for fences.

OUTDOOR IMPROVEMENT WORK OF CIVIC LEAGUE OF ST. PAUL.

MRS. CONDE HAMLIN, PRESIDENT.

I find myself this afternoon in speaking before the horticultural society in the predicament of the woman who spoke last month before the New York Federation of Women's Clubs. Her paper was on the subject of domestic science, and she said she had done so much talking about domestic science that she had had no opportunity to learn about it, and she hoped after she was out of office to be able to take a course in domestic science in college. I feel very much that way. I have had so much to do in trying to get what little has been accomplished done that I have not had much opportunity to learn the real things along this interesting line of work for which you meet here today. The secretary gave me permission, and I came here on the condition that I may be allowed to speak to you without notes, as for want of time I could make no preparation, and what I may say to you may be somewhat discursive, but I shall aim to give you somewhat of an idea of what the Civic League in St. Paul has done. By the program of our open meetings this year you will see at once that our outdoor work is a very small section of our activities, and you will realize that the limited amount of work we have done in that line does not imply that we have accomplished nothing else. Our activities cover a wide scope.

In regard to the outdoor work, I will read briefly from my first and last report. I will just read a little section concerning our work in parks, streets and vacant lots which will show you what we have done along that line:

"A text for our work in this department was furnished by the president of the park board, when he said, in an address delivered at an early meeting of the league: 'Women are peculiarly fitted for this work, for it is only housekeeping on a large scale—municipal housekeeping—and women are our housekeepers by right and law of sex. It is their province to make and keep our homes neat and clean, and well ordered and beautiful indoors and outdoors, and it is a perfectly natural and logical expansion of that province that the queens of the household should extend their sway into the street which fronts their premises and into the immediate neighborhood. Women could put the inspiration of their love of order and beauty into the administration of these branches of the public service.' The league's first step along this line was taken in the appointment of a committee instructed to endeavor to secure the passage through the state legislature of two bills, known as House Files Nos. 637 and

638. One of these bills provided for the planting of trees in street lawns by the park board, on petition of a majority of the property owners in a given street; the other for the cutting of grass in street lawns on similar petition. The committee was successful in rescuing both of these bills from the oblivion into which they had been pushed by more aggressive measures and securing their passage.

"The league then set about formulating a plan by which the residence portion of the city might be thoroughly policed with a view to improving the appearance of vacant property, neglected street lawns, untidy alleys and the like. A committee known as that on parks, streets and vacant lots, was created, with Mrs. Willis Hall Vittum as its chairman, and a truly remarkable piece of organization was perfected under her active and capable leadership. In the seventh ward, which is practically a solid residence district, almost every street had its chairman and, with few exceptions, each block its sub-chairman. The influence of this sort of organization was not only direct, but reflex, and I am told that the woman is not far to seek who, clothed in a little brief authority, has taken her skirts in her hand and sallied forth into her alley righteously intent on plucking a mote out of her neighbor's back premises, only to discover a beam in her own. It is hardly necessary to dwell upon the miracle which has been worked in the appearance of many of our streets during the past summer. Hundreds of feet of vacant property which had been a perpetual eyesore, covered as it was with ashes, tin cans, rubbish of all sorts, overgrown with noxious weeds, offensive not alone to the eye, but to the nostril as well—have been put in clean and orderly condition through the organized effort of the women.

"The second ward, better known as Dayton's Bluff, with Mrs. F. W. Bergmeier as chairman, has developed a feature peculiarly its own as far as our city is concerned. The active co-operation of the school children was secured, and a children's auxiliary formed, which christened itself the Junior Civic League. The keen interest displayed by these children in the work of improving the neighborhood readily leads to the belief that a children's league of good citizenship might be successfully inaugurated in connection with the public schools of the city at large. The following invitation, inscribed on a postal card and signed by the ward chairman, gives an idea of the manner in which the little people were led to cooperate with the grown-ups on the bluff last summer: 'As a member of the Junior Civic League you are requested to assist in putting the large lot in Ravine street, extending from Bates to Maria avenue, in order on Saturday evening, July 15th, from 6 to 9 p. m. Please bring a sickle, hatchet or spade with which to carry on the merry

war. Invite any one who is strong and willing to work. The ladies will serve refreshments.'"

Some of the other things we have been able to do right along this line is to secure petitions for small parks in various sections of the city and undertake to get the property owners to pay their fair share of the purchase price. One of these has been condemned and assessed, and the others probably will go through. There has been quite a sentiment worked up in connection with improving our boulevards in outlying sections. We have had meetings arranged where the plans have been discussed.

The work in the wards is done in the summer, and in the winter we have our program and do such general work as we can do.

I will read another brief extract from my report to show what we accomplished in connection with the health department in the matter of sanitation, pure milk and the disposal of garbage:

"The work of the league which has told most directly upon the community as a whole during the past year is that which has been done in co-operation with the city health department. The league had been in existence barely a month when it responded to an appeal made to it by the commissioner of health to aid in securing the passage of an ordinance providing that dairymen supplying the city with milk be required to submit their herds to the tuberculin test before they could receive a license. True to its colors from the first, the league spared no effort to bring the matter to a successful issue, even to invading the sacred precincts of the council chamber in silent but awful array. The persuasive eloquence and daring generalship displayed by the health commissioner on that occasion, fighting against odds as he was, inspired us with a confidence in his prowess which subsequent encounters under his leadership have only served to confirm. The league from the first regretted the necessity of requiring a fee from the dairymen—since ruled to be unconstitutional by the supreme court—but under the interpretation of the charter made at the time no funds for the expense incident to the inspection were held to be otherwise available.

"The health department reports that since the passage of the ordinance, April 22, 1899, 2,084 cows have been tested for tuberculosis, of which number 154 were found to be diseased.

"The present week is a notable one in the annals of the league in that it is distinguished by the capitulation of the enemy in the great garbage campaign. For two months the warfare has waged from committee room to council chamber and from council chamber to committee room. With the heroic figure of the Herr Doctor in the van we have stormed one kop only to be repulsed with fearful

though bloodless slaughter at the next. We have turned our adversaries' flank in the night only to find him sleepless and watchful, drawn up in battle array across our path. But at length the cruel war is over. We thank our allies who have so valiantly stood to their guns, and now with good will toward all and malice toward none we lay down our arms and return to our homes, after the manner of the American citizen soldier since the government began. It but remains for the women of the city to co-operate individually with the health department in the working out of the details of the new system. Let each housekeeper now do her part and the result will be so manifest an improvement over the old state of things that even those who have opposed the change will be glad it was made.

"A brief resume of the circumstances which brought about a solution of the garbage problem may not be without interest. The work done by the women last summer in the organized wards tended to make apparent the necessity of a radical change in the system of garbage collection, and for some provision for the disposal of tin cans, waste paper, bottles, ashes, old shoes, etc., other than by permitting them to accumulate in alleys and vacant lots. In the business wards a systematic plan of weekly inspection and report was conducted from early in May to October 1st. These wards were divided into districts, and a woman inspector placed over each district.

"The result of the summer's work was two fold. The appearance of the districts covered was immensely improved and—what has proved vastly more valuable—a comprehensive grasp was obtained of the whole problem of city waste as it affected our city and the way pointed out of its solution. It was readily apparent that the first thing to be done was to get rid of the contract system, and we set about doing it. Our greatest strength from the first has been that we were so familiar with the facts that we knew we were on the right track, and the trial which has been given the health department, even under adverse circumstances, since the contracts expired December 31st, has served to strengthen our position. Everything is now working smoothly, and we are assured that the expense will fall well inside the appropriation."

I suppose this last year the most important thing we did was to educate public opinion in favor of getting a new charter before the people, and in a very quiet way we started the wheels rolling a little and then worked with the committee who had the matter in hand. I am not laying the credit of all this to the league, for it would have been practically impossible to do the work in the time we had at our disposal, as it required four-sevenths of the ballot cast,

and it was only two weeks before the time the charter would be adopted. A very successful canvass was made and forty-two meetings were held and addressed by the most representative men in the city. Twenty-five thousand slips were distributed; then on the day of the polls the boys of the high school, wearing white badges to indicate their authority, were posted at the various polling places in the city to distribute these slips under the auspices of the citizens' committee. On the slips were printed the words: "Vote for the charter." With a total vote of 22,857 we carried the charter by 17,845, whereas it required only 13,061. So we have home rule, no matter what our charter is.

In one or two other things the league has taken an active part in outdoor work. The league conducted two play grounds last year and one this, putting more money into the one we conducted this summer, feeling it is better to do one thing well than to do a half dozen things and slight some features of the work.

Then we are also interested in the improvement of street car lines, which work is stimulated by ward improvement associations. I do not think the women intend to keep up this street block organization further. The idea is merely to arouse public sentiment and help people to realize the way things ought to be done, and so we hope the result of our outdoor work will be to have an improvement association composed of both men and women, thinking they would be interested in carrying on the work in the solution of social and economic problems.

I have perhaps not mentioned all the things we are interested in, but I have spoken of the general features of our work as it has been carried on thus far. I think this gives you a complete idea so far as I am able to present it to you of what we are trying to do. (Applause.)

Mr. C. M. Loring: I wish to impress upon your minds the importance of the work done by the lady who has just spoken. The fact is, as many of us must realize, that our Minnesota villages, a great many of them, are a disgrace to the state. There has not been the least movement made for their beautifying or for æsthetic improvement. These improvements come just through such organizations as Mrs. Hamlin represents. The beginning of all those improvements is through those little associations that are started in the neighborhood or in the villages. The village improvement association is one of the most important organizations that you can have in any village at the present day. It has been my good fortune to have seen the effect of the work done by some of those organizations which were started under the most discouraging circumstances. We all of us who have come from New England villages know how beautiful most New England villages are. The villages in the west

that have been founded for thirty to forty years or more look just as they did thirty or forty years ago. There is no reason for such a condition of things. In a little village in Kansas where there are but sixty-five voters there is one of the most perfect organizations to be found in the west. It was all brought about by the influence of one man. In 1891 that man planted himself on the naked prairie. There was not a tree or shrub in sight. Today it is one of the most beautiful places in the country. I refer to Bluff City, Kansas. Every house is surrounded by a neat fence, every house has beautiful trees around it, and it is surprising how the trees have grown in the short time they have been planted,—and I was told that every owner of a house had a lawn mower. It is situated in the midst of some 50,000 acres of wheat, and at the regular band concerts in the park the farmers from all around drive in and enjoy themselves. Bluff City is a practical example of what one or two leading spirits can do in a community to bring about ideal results, and it does not take many years to do it either. Is it not to be believed that children raised under such circumstances and surroundings make better men and women than those others who live in this state and the Dakotas? I believe that we in the west should go to work today,—every one of you should go home and organize in your towns and villages improvement associations. (Applause.) The lady who spoke about the school grounds here has a very high standard, there is no doubt about that, and it seems as though we could hardly ever reach it, but you can if you begin where you should. You have got to begin, as one gentleman said, by educating the children, not the parents of the children. One man said today, in speaking of planting trees on school house grounds, that after the trees were planted the neighbors would destroy them. Such a thing cannot happen in that little village in Kansas. In a little city in Missouri the superintendent of the school makes that one of the important points, one of the great studies, nature study. The teachers are obliged to take their schools into the woods, and those children are taught to know the trees and shrubs that are growing there. There are children in Minnesota who never saw a tree; especially are there such in the Dakotas. I owned a farm in Dakota myself, and I know acres and acres of country like that; not one single tree in sight; crops grown there worth thousands of dollars, but not one dollar to beautify the place.

I want to impress upon you gentlemen this thought: Go home and start an improvement association in your town, in your community and make Minnesota the most beautiful state in the union. (Applause.)

Mrs. A. A. Kennedy: There is one little town in this state that is a good one. It is the nicest town I have ever seen. It has beautiful streets, handsome lawns and an abundance of trees. We have two large school houses, and right behind the school house is a nice lawn, and we also have an electric light plant put in. Our door yards, both front and back, are kept clean; we have trees and evergreens all around; in fact, as I said before, Hutchinson is the most beautiful town I ever saw.

Mr. A. G. Long: I live at Lake Minnetonka, which has been termed the Lake Como of America, and where of all places it would seem, with its wonderful natural beauties, that the improvement and beautifying sentiment should flourish. A little less than a year ago I asked Mr. Loring to come out and give us a practical talk along the line of improvement, which he did, illustrating it with lantern slides, and it was the means of organizing an improvement association, but in the community the sentiment is as dead as though it had never been heard of. It is absolutely impossible to have an attendance of more than a half dozen at each meeting, and the work the organization is trying to accomplish is even ridiculed and laughed at by some of the best citizens. We have been told here today what we ought to accomplish with an improvement association, and the suggestions are all very good, but first of all we want to know how to get a community interested, how to create a sentiment in favor of improvement. When we have found that out the rest will be easily attainable.

Mr. Frank Yahnke: Get the ladies interested.

Mr. Long: Tell us how.

Pres. Pendergast: You must have this association work up a sentiment for improvement. Set about it in the right way, stir up an enthusiasm, and you will accomplish something by and by. The trouble is with my friend at Lake Minnetonka that he expects to accomplish too much at once. He should feel like the neighbor's boy who lived beside me in New Hampshire. One day the boy said to his father, "Pa, I have looked out for my winter's cap; I caught a musquash today." "Yes," said his father, "that will make you a good cap, but where is your musquash?" "Well," said he, "I didn't quite get him today, but I am going to have him tomorrow." (Laughter.) And so if he cannot have this thing done today he will have it done tomorrow if he keeps right on.

GROWING STRAWBERRY PLANTS FOR RE-SETTING.

E. F. PECK, AUSTIN.

To obtain the best results, the soil should be thoroughly subdued the year before planting, and this can best be done by a hoed crop. If the ground has been enriched by a plentiful application of manure from the cow stable, a crop of sweet corn will not seriously detract from its fertility, and the weeds can better be kept under subjection than with any other crop, being planted late in May and maturing as early as the last of July, when all weeds that escape the cultivator can be destroyed. The corn stubble can easily be gotten rid of by straddling the row with a team and a sharp plow cutting off just below the surface of the ground, when the next plowing will carry it to the bottom of the furrow. This should be done early in September to the depth of at least eight inches.

This method requires twice plowing in the spring, but tillage adds fertility, and a thorough pulverizing and fining of the soil to

the depth of eight inches insures plenty of moisture for the plants, provided the surface is kept from encrusting by frequent cultivation with a fine tooth cultivator or rake.

The best time to kill weeds is when they are below the surface. I have a rake three feet in width with 60d spikes for teeth two inches apart, set at the proper angle for good work, and I like it so well that I often go through the patch with it in preference to the horse and eleven-tooth Planet Jr. with pulverizer attachment, because it runs light and is so quickly and easily turned at the end of the row.

I advise setting plants as early as the ground can be got in condition. April is a good time, and is a little ahead of the rush of spring work. The atmosphere is cool, the soil always damp, and plants set at this time seldom receive any noticeable back-set.

Rows four feet apart and plants two feet apart in row. I would not set different varieties side by side, but rather ending one to another with sufficient distance between to insure no danger from mixing.

I set plants with a mason's trowel, putting the roots down to their full length, taking pains to spread them out when placing in position, thereby helping them to quickly gain a foothold on the soil.

Cut off all runners when they first appear, allowing none to joint until the middle of July, by which method the parent becomes exceedingly vigorous. By this means the ground can be kept perfectly clean from weeds, which could not have been easily done if the first runners had been left to grow and take root.

By this time strong runners will put forth from all sides, and by watching for vacant places and training in that direction all the ground will be occupied with plants and no weeds left to sap the soil of fertility and moisture.

This method, as a rule, brings the hoped for result, but if the exception should threaten and a failure seem inevitable by reason of drouth, and plants do not root, put in the cultivator, although it will crowd the plants along the row, which is fatal to the best results,—but it is the only thing that can be done if many plants are needed. By this method many plants will be covered too deep, but the greater part will come through and nearly all will take root. I would not, under any circumstances, put in the cultivator till the middle of September, but rather take the chance of a late fall with attending rainfall. I would not use the cultivator on my whole plant bed, but run the risk of a failure on a portion, and if the first method was a success I would know where to get the plants for my own use, and to fill small orders at remunerative prices, and also where to get

plants in competition with those that are advertised by many growers at prices that I do not consider a fair compensation for the best that are produced under the most favorable conditions.

I have noticed that a dry July and August is almost invariably followed by plenty of rain later on.

By the first method, with a little care and some labor, plants can be made to form from four to six inches apart over the whole surface which makes ideal plants and an enviable reputation for the grower. The latter method insures many good plants, and as an offset for the difference in the result of the two methods a good crop of fruit can often be secured by leaving a hedge row of plants to bear and a redistribution of the mulch over the entire surface dug over. I find the strawberry a very vigorous and persistent plant, and it often succeeds under adverse circumstances.

If one is only raising plants on a small scale, the layering process never fails, but it can not be profitably followed in commercial planting.

I would not be averse to planting on ground that had not been fitted the previous year, if rich enough for most garden crops, but would not manure the same season unless by top dressing in early fall if plants had set plentifully.

I mulch before the ground is frozen to a depth of six inches with well threshed barley straw. It remains in position the best of anything I have used by reason of its fineness, and it is generally quite free from foul seed.

OPENING OF THE NEW HORTICULTURAL HALL, BOSTON.

Possibly never before in American history has a building devoted to the uses of Horticulture been opened to the public with so much eclat as attended the function of the Massachusetts Horticultural Society this week. The doors of this half-million dollar structure were formally opened to the public at 8 p. m. on Monday, June 3, and in less than an hour 2,000 visitors had passed in. These were mostly members of the most aristocratic families of Boston and district. It was fitting that such a congregation should be received by the most aristocratic of Flora's Kingdom, and of these there were never before in this country such an assembly. The most recherche of every country and clime had been brought together. Representatives of tropical America and of the islands of the seas vied with those from India and from Japan.

It is still an open question, after watching the multitude of visitors, as to which of Flora's gems were the most attractive. Honors seemed to be equal between the wonderful group of fifteen Wistarias (including three white), specimens varying from six feet to sixteen feet in diameter, and with stems five feet to twelve feet in height, all in large pots or tubs; Professor Sargent's Azaleas or the exhibit of about 1,000 plants of Orchids in many varieties.

The exhibition is divided over three halls. In the first hall on the right was an excellent display of Gloxinias, Pelargoniums, Calla Rothschildianum, Hydrangeas, and Amaryllis, also the wonderful Wistarias from Mr. Sargent, already mentioned. Another notable plant in this hall was the large Licuala grandis, from Mr. Hunnewall. And to help the setting were two extremely fine Bay Trees (Laurus nobilis), from Mrs. C. P. Sprague. Passing from here to the large hall through the "loggia" on the right and left, are about two dozen monster trained plants of Rhyncospermum jasminoides in full bloom—a grand lot!

From here the visitor works down upon an indescribable display of color made by the Indian Azaleas, and from the banking and bedding in green sod one is immediately reminded of some of the brilliant shows of pleasant memory at the Royal Botanic Gardens in London. The effect of natural paths and green sod is good. The specimens are in perfect condition. Mr. Hunnewell's Rhododendrons at the extreme end are very attractive, and will improve day by day during the week, being only partially opened as we write.

Next is the Orchid hall, where one is ushered into the presence of such an extravagance of wealth as is seldom seen. Five dollar plants and $500 plants stand side by side, or are used for grouping and display in such democratic fashion as is possible in Boston and nowhere else in the world; for we venture to think that never before have owners of rare plants allowed their own identity to be lost at an exhibition or the identity of their rare plants. Yet such is the case throughout this exhibition. Plants are staged as best calculated to force certain color value, regardless of ownership. The orchids have not been assigned sufficient space, although arranged in the same manner as a well filled conservatory, without divisions.

So great is the success of the show that it will be kept open another week yet.—(American Gardening.)

For Earthworms in Pots, use lime water freely. Slake 1 pound of fresh stone lime in 1 gallon of water and let stand for 24 hours. Pour off the clear liquid without disturbing the lime in the bottom and put your pots in this water for about five minutes.

WISDOM OF NATIONAL PARK MOVEMENT.

LEO M. CRAFTS, M. D., MINNEAPOLIS.

In what I have to say I am going outside the physician's standpoint because I am interested in this subject for more reasons than that. Let me briefly review the general reasons why it is wise to establish a national park in the northern part of the state. You all know thoroughly well, I presume, the location of the proposed park, and yet some of you may not have a very clear idea of it. I have brought with me a map of the state, and you can see that the proposed park area is located in the north center of the state. These lakes form a great reservoir which serves as a supply for the Mississippi river. One reason why it should be established for a national park is for the improvement of the water supply of the Mississippi river. Capt. Allen referred to the drying up of our lakes and rivers incident to the cutting off of the timber. Some of us have observed the depreciation of the water supply during the last twenty-five years. In the Mississippi at this point (indicating) there has been a marked depreciation. It is estimated that the cutting of the timber around these lakes will diminish the water supply to such an extent that in less than forty years no water power will be available for practical purposes.

Another reason why the timber should be preserved and a national park provided for is because of the influence of forests upon the rainfall and moisture, with the conditions of which most of you are more familiar than I am. I have lately seen it stated that the forests have no relation to the rainfall and water supply, but that certainly does not agree with established theories I have read, and I think it is well established that the rainfall does depend in a large measure upon the forest area itself. Those who have not traveled cannot appreciate the desolation which reigns over the northern part of the state where the lumberman has gone ahead and fire has followed him. To the slashes which remain the forest fire would to a large degree be an improvement. Within forty miles of the interior I have seen a partial failure of the crops, and it is a well established fact that the drouth this year (1900) was brought about partially by the cutting of timber in the northern part of the state, and this is only a beginning in a state that has practically never seen a crop failure. The time will come when, as a result of this timber cutting, the failure of crops will be the rule and not the exception. I am personally familiar with that country, I have been there a good many times. For recreation there is no other region in America that can equal it, and if we look on the aesthetic side of it we ought for that

reason alone to endeavor to preserve it for future generations who may be within reach of this region. There are twenty-four million or more of people living within twenty-four hours ride of that region, and I think it has been clearly established that there is no other single region in this country that has equal health qualities for a great many conditions as that region in the northern part of the state. I personally know of a number of lives that have been saved by going there.

There is another reason I might speak of why this tract should be preserved, and that is that it would be sure to attract thousands of visitors from outside the state; it will justify railroads in building their lines in that direction, and it will be the means of bringing millions of dollars within the state. Within the state of New Hampshire are the White Mountains, which cannot be compared with this region, and six and one-half million dollars are left there yearly by those that come from outside the state, and at the rate the influx is increasing the income from that source will soon amount to twenty millions of dollars or more. We would have an income to this state of as large an amount as that if this national park project were pushed to completion.

I am particularly to emphasize the value of health conditions and the value of the region as a health resort, not only for consumptives, but for nervous conditions and a great many other conditions of physical failing health.

Now a few things in reference to the objection to the acquiring of this region as a national park, and what some of us or all of us may be able to do towards preserving it. There is no objection except by lumbermen. The inhabitants of that region do not object to it. The town of Cass Lake appreciates the value of it, and the business men in session there not long ago unanimously voted to support and favor the park measure. In the town of Cass Lake sentiment is divided. It is right in the midst of the proposed reservation, there are two big lumber mills right in the town, and it is their object to throw all the obstacles in the way of this reservation. If the destruction of the timber is kept up at the present rate it will be gone in a few years; 140,000,000 feet is small compared with the whole amount to be cut. I understand the estimate is 300,000,000 feet, and if the lumberman goes in and cuts that amount, fire will remove three times as much. You may have seen the statement in the report of the fire warden which spoke of the number of townships burned over in the past few years, and most of the fires were started in the slashes of the lumberman's cuttings. I also saw an account of two lumbermen being convicted of setting fires for the purpose of mak-

ing dead and down timber, and they were sentenced to prison for two years without the option of a fine. A few years ago a verdict was rendered in the courts against certain parties for the stealing of twenty million feet of timber from the Winnebago Reservation. I found last summer at the base of a magnificent pine tree a little tin torch that was set within the hollow of the tree to produce dead and down timber. Men are hired for that purpose. That is the way they get much of their dead and down timber. I have here three photographs that were taken of the three stages in a pine forest; one the white pine before it is cut, another showing the slashes and the third showing where the fire has burned the slashes, and they were all taken within a quarter of a mile of each other at Leech Lake.

I want to say here that Mr. T. B. Walker who owns land along the shore of this lake outside of the reservation has recently signified his intention and willingness to have that land devoted to this purpose. In other states in the United States there have been regions set aside as forest reserves. In states further west it has been done, but in this state the United States has not done it.

If this region is secured as a national park it will be one of the most picturesque spots in the country. I hope every one of you will become an advocate for this national park in the northern part of the state, and that you all fully appreciate the reasons for making it a permanent reserve.

The President: I am exceedingly sorry we have not the time to hear from Mr. Chapman, who is located in the pine territory and who made an experiment of planting evergreens of all kinds and only one per cent of them have been killed. He has prepared an article as I suggested to him, and he has taken photographs since the snow came. He planted fifteen or twenty varieties where the stumps and slashes were left and a good many trees were left in their native state after the lumbermen had got through with them. The experiment was very interesting to me. I hope some of the newspapers will take this up and publish it.

The plant boxes usually set in the window on a broad shelf or sill are liable to warp, to be tipped over or injure the window sill. A better way is to support the plant box even with the sill by strong iron brackets, and to line it with a water-tight zinc pan. This can be made quickly and inexpensively at any tinsmith's. The edges of the box might be converted into shelves for small pots by nailing narrow strips of wood along the top on three sides.

SYRINGA JAPONICA.

PROF. S. B. GREEN.

This is a lilac from Japan that is not as well known as it should be. It is of vigorous growth and easily takes on the tree form, producing no suckers from the root; in fact, it is a small tree rather than a shrub. In appearance the bark resembles that of the plum. It does not come into flower early, but generally has to be from six

Flowers of Syringa Japonica, from specimen over ten feet high and perfectly hardy, at Minn. State Experiment Station Grounds.

to ten years old before it produces blossoms. These appear in the latter part of June or early in July. They are a yellowish white in color, and the clusters are frequently sixteen inches long. As the tree produces a large number of such clusters, it is one of the best ornamental plants that we have. It continues in flower after the other lilacs have gone. It is one of the hardiest plants that I know of, and is probably fully as hardy as the common lilac. It should be more generally known. It is especially well adapted to parks and large shrubberies. I doubt very much if it ever becomes very popular, on account of its requiring such a long time before it comes into flower.

TOOLS FOR GARDEN AND ORCHARD USE.

S. D. RICHARDSON, WINNEBAGO CITY.

I have been a farmer and nurseryman all my life, and what I have to say will be for the farmer, for I do not know what tools are necessary for the market gardener. I would state as a starting point that if possible a garden should be situated so that a horse can be used to cultivate, and that everything be planted in rows. I sometimes plant three rows of the small vegetables close together and use a hoe for the two inside rows and cultivate on the outside. Some kind of an adjustable cultivator for one horse, that will stir the ground thoroughly, three inches deep, if necessary, and leave the ground level, not hill up the rows, seems to be necessary for both garden and orchard. We use one with fourteen shovels the size of ordinary seeder shovels. If used often and early enough, while the weeds are small, there will not be much use for a hoe between the rows.

For the orchard two whiffletrees, each eighteen inches long, an evener to match, some cloth to wind the outside ends of the whiffletrees, a steady team and a man to drive them that has what a Yankee calls "gumption" and a westerner "horse-sense," and the tools usually found among our farmers will be all that is needed.

Mr. Wyman Elliot: I think we want to emphasize the last clause of Mr. Richardson's paper, the "gumption;" I think that is the foundation of all cultivation. Now, the tools we have for gardening and for orchard use are nearly the same, and the first tool is the plow. That is the most essential tool on the farm. A good plow should turn the furrow nicely and should break and pulverize the soil. Then we follow the plow with the harrow. Either the spike tooth, the disc or the Acme harrow should be used, and I think the Acme is the preferable tool of the three for putting the soil in the best condition. Mr. Richardson has not touched upon gardening tools, and being an old gardener, perhaps I would be more familiar with that part of it than some others. The gardener has to use tools very similar to those of the farmer, and sometimes he uses tools that the farmer does not use, but I think every farmer should have what is called a seeder and cultivator combined. The Planet, Jr., and the Matthew seed drills are two very essential forms of tools for the gardener, and they can also be put to good use on the farm, especially where farmers grow any kind of garden truck. I am sorry to say that our farmers as a class do not pay the attention to growing vegetables that they should. There are many of the minor tools, such as the spade, fork, hoe, etc., that are very essential on the farm and in gardening, but there is one tool in particular that I want to recommend to you all if you want a good one, and that is the Bronk hoe for the destruction of weeds. You can take a long handled manure fork and have the tines turned down five or six inches, and then you

have a six tined implement that will work to perfection, and it is very cheap. If you can get the old Hexamer hoe, which is adjusted with a wedge to hold it in place, you will have about the same implement, but you can take a long handled manure fork with six tines and have a tool made that will answer the purpose excellently.

Mr. C. W. Merritt: One of the best tools the farmer or gardener can use is the twelve toothed cultivator with a pulverizer dragging behind. In my experience of twenty-five years I have never found a tool which gave me so much satisfaction. I use a small one-horse plow in the rows of berries and then go over with that twelve tooth cultivator between the rows which pulverizes the soil thoroughly and deep enough.

Mr. C. E. Older: I failed to hear one tool spoken of, and that is the Breed weeder. Those weeders give the greatest satisfaction, but the ground must be thoroughly prepared before it can be used, but in strawberries and small fruit you can go through them with one horse, and it kills the weeds before they come up, and it keeps the ground thoroughly pulverized. You can go over ground twice in a day with the weeder where it would take you a week to go over with the hoe. There is one farmer in our county that uses the Acme harrow. I consider it one of the best tools for the orchard or for the farm, and I consider it essential to use the Acme harrow before you get ready to use the Breed weeder. Taking the little Planet Jr., wheel hoe and the horse hoe, they make a very satisfactory combination. Keep the horse going and let the horse do all the work possible.

Mr. J. P. Andrews: What is your soil?

Mr. C. E. Older: It is a light soil.

Mr. Oliver Gibbs: I just want to say a word. The commercial gardener and the home gardener in the preparation of the soil need about the same tools, but when you come to the tools for the home garden, instead of labor saving tools they are luxuries and not necessities. I have nearly all of them, but I am always reminded of the remark of Mr. Stickney, of Wisconsin, that the best tool he had was the old fashioned Dutch hoe. Let me substitue the Warren hoe, and you may have all the rest of them; I have not much use for them.

Mr. Frank Yahnke: I would like to make a remark on the subject that Mr. Richardson brought up about planting three rows together. I have been a gardener almost all my life. I never could make a success planting three rows together and then cultivating on the outside and working the center with the hoe. You cannot find the average farmer willing to do that; he will not work with the hoe if he cannot work with the horse. I can plant the rows twenty inches apart and still get through with the cultivator by setting it close together. If you are careful you do not cover anything, and you will hardly have any hand work to do. Most farmers do not like to work with the hoe. Encourage him to use the horse, and he will plant vegetables; advocate the planting eighteen inches to two feet apart and then use the horse hoe, and he will hardly have any hand work to do. I planted a piece of land in sugar beets for cattle, and I worked them with the horse hoe, except that I used a narrow hoe

to thin them out about eight inches apart, and they were perfectly free from weeds.

Mr. R. H. L. Jewett: I wish to emphasize what has been said in regard to the Breed weeder. We have a Surprise weeder. It is a surprise to see how much one can do with it after having run the ground over with an Acme harrow. Every weed is thoroughly destroyed. I want to say something in connection with another tool that has been mentioned, and that is the Planet Jr. twelve tooth drag, or harrow. Any one who has used the Planet Jr. hand cultivators knows what is called the hoe, a little tool with branching blades. We have had made for our work a large tool for the horse cultivator similar to the small tool. It is a steel blade about eight inches wide with a shoulder and socket so we can fasten it on each wing, and this is run along just under the surface of the ground. In cultivating melons, strawberries or vines that run out from the plant, you can run it close up to the plant as the tool runs along under the soil and does not disturb the vines but destroys all the weeds, and by reversing the action of the hoes, changing them about, it cuts everything on the inside between the rows. Above all we find the weeder referred to to be the best tool we have. We go anywhere with it; we have no trouble going anywhere.

Mr. J. P. Andrews: I would like to ask Mr. Jewett if the Success does not go over the ground better than the Breed weeder.

Mr. Jewett: I think it does. The Breed weeder has round teeth and straight, and the Success has curved teeth.

Mr. W. L. Taylor: I consider that one of the most valuable tools I have. We run a farm as well as a nursery, and we use it in the corn, and we run over the corn when it gets ten to twelve inches high, and we run over everything before the weeds start; but after the weeds are fairly started it does not give satisfaction.

Mr. S. D. Richardson: I had a neighbor who had a cornfield on one side of the road, and I had one on the other. He used the Success weeder, and I used the harrow, and my success was much better than his.

Mr. Clarence Wedge: I think it ought to be stated that the success or failure in the use of these weeders depends altogether upon the character of the soil. If the soil is loose and sandy the weeder is a great success, but if the ground is a heavy clay soil, like mine, it is a failure; but my neighbors on their light soil use it with great success.

Mr. Jno. Freeman: I have given the weeder a very thorough trial the last three years in heavy clay loam soil, and it will do nothing after a rain. We have got to put in extra work with the old farm cultivator. After we use that it is a very fine pulverizer and smoother if the ground is in perfect condition, but in heavy soil it has proved a perfect failure with me.

Mr. C. E. Older: I have had no experience in heavy clay soil, but I thought I emphasized the fact the ground must be in nice condition before you use it, but then you can use it with the greatest advantage. In our loam soil it is just the tool to use.

Mr. J. P. Andrews: We have a Breed weeder but never had

any use for it until this year. We have had it for seven or eight years, but we always had rain enough so we did not need to use it until this year.

GROWING EVERGREENS FROM SEED.

CLARENCE WEDGE, ALBERT LEA.

It is the usual practice to lay out the land in beds four feet wide, with paths between them about a foot wide, and this is the plan that I have adopted. I like to do this work in the fall, as it gives the ground a chance to settle and assume a permanent shape before planting time. When freshly made the beds should be three to four inches higher than the paths, and if the land is on a slope subject to wash in a heavy rain it is very important to provide ditches sufficient to prevent any water from running over the beds, as any wash would be very destructive during the greater part of the first season.

With the exception of the red cedar, I sow all seed in the spring. Whether early or middle or late spring sowing will be most successful will depend more on the peculiarities of the season than with almost any other crop, but taking one season with another I think the last week in April will be about the best time.

There is no dainty more enticing to mice, gophers and squirrels than evergreen seed. They will dig for it as soon as planted and keep industriously at it even after the seed has sprouted and been brought to the surface by the little seedlings in the act of breaking through the ground. Hence, it will be wise to make a systematic effort to poison all such vermin before sowing the seed.

The posts or stakes to support the artificial shade necessary for most species the first season should be set at this time. Any artificial shade that shuts off half the direct rays of the sun will be sufficient. Seedlings do not make a satisfactory growth under the shade of trees, probably on account of the presence of the roots in the soil under the beds. The fixed elevated shade, usually made of brush placed about seven feet above the beds, and the movable low lath shades resting on stakes about a foot high are in general use. The elevated shade has the advantage of allowing perfect freedom for work beneath it, and two years ago I would have said that it was the only sensible kind to use. But the past season those portions of our beds that were under the low shades gave us much the best stand and a decidedly better grade of seedlings, and for next season's beds I shall use about half of each kind.

As a final preparation for the seed, which is sown broadcast by hand, I go over the beds with a common iron rake, making the earth as smooth as possible and leaving what I find to be the best possible surface upon which to make an even distribution. After sowing the

seed I smooth and pack the surface by patting with the back of a bright spade, and then sift on clean sand, a quarter of an inch deep over the smaller seeds, like the arbor vitæ and white spruce, and a half-inch deep over the larger seeds. I find that many varieties of weed seed do not germinate as freely under such a layer of sand, and that it makes a most excellent mulch to retain the moisture of the soil in such a case as this, where cultivation is impossible. As soon as the seed is sown the land should be inclosed with poultry netting with the lower selvedge carefully staked down, so that no dog, rabbit or even mud turtle will be able to get within the inclosure, as there are several weeks that the tracks of even such insignificant creatures will be very destructive.

And now begins the merry war with beast, bird, drouth, weeds and fungus. All are the avowed, persistent and frequently successful enemies of the undertaking. Scatter poisoned corn meal mush as long as there are indications that any rodents are left. Keep a boy with a shotgun and plenty of ammunition working in or near the beds every day to scare away the birds, until the trees are well in leaf. Water in time of severe drouth, root out the weeds, and within a few weeks you will have a reasonable certainty of gazing with pride and satisfaction upon a multitude of little trees. But, alas, your wonder will change to a very different feeling, as within a few days you stand helpless, watching your fine stand of seedlings change to ragged and unprofitable beds, the work of an unseen and, so far as we know, uncontrollable fungus. The remedy that is generally proposed for "damping off," I have given a pretty thorough trial without being able to discover any important difference between those portions of the beds that were treated and those untreated. It is a very tedious and expensive process—sprinkling with sand, which has been dried and stored for the purpose, over the beds as the ground begins to dry after each rain. It may do some good, but it is no specific. Perhaps I did not go at it the right way, and perhaps I had a virulent form of the disease. I shall try again and advise others to do so. The greatest surprise that I have had in watching the erratic conduct of this destructive fungus was in losing a fine stand of Scotch pine and Norway spruce during three weeks of perfect drouth last summer. I thought it ideal seedling weather, but they damped off just the same, although the surface of the ground was bone dry.

The summer care of the beds is the simplest possible matter, consisting entirely of pulling the weeds as fast as they get large enough to handle.

On the approach of winter, poison should be again freely used

to rid that portion of the nursery of mice, as they delight to nest in such a dense and cozy shelter, and in making their system of runways and in working off their surplus energy generally will make sad havoc among the little trees in one short winter. It is also necessary to spread a slight covering of straw over the beds the first winter, and even then they will occasionally come out looking more or less browned, especially if they did not fully ripen up the previous fall.

VALUABLE FACTS.

EDSON GAYLORD, NORA SPRINGS, IA.

I wish to refer to what I deem a most interesting occurrence in connection with a Charlamoff tree, started by Prof. Budd about 1882, and sent to me in 1886. In 1899 it set full of fruit; two-thirds of the top died in August, but the other one-third matured a fine crop. In 1900 this one-third blossomed and hung unusually full and for some months seemed to flourish finely, but in August it commenced to fail and was soon dead, seemingly, root and branch. Later on I grubbed up the tree and thinking there must be something very strange in its dying in such a way I examined its roots carefully and found the first two-thirds of its roots dead and rotten. These were at the bottom. The other one-third of the roots were dead, but still quite sound, and these had started out from the upper part and from the other side, as could be very plainly seen, from the Charlamoff scion. I have referred to this, as I consider it a most important fact worth its weight in gold to horticulture over the northwest.

In close connection with this object lesson I have another teeming with like importance. Somewhere near thirty years ago I secured a number of apple trees and set them on a fourth and fifth rate site. They were of various kinds, including a number of Wealthys, top-worked on Transcendant crab trees about three years old. These and all the others excepting two Wealthy trees were started on tender roots. These two Wealthys were started on crab roots. Eighteen hundred and eighty-five found all these trees dead except the Wealthy. They were set back in the tops some, but came right on and have been bearing heavy crops of fine fruit ever since. They came through that firey ordeal better than my Duchess, close by them. In short, these are nearly all the Wealthy that can be found of that age in this township. These are facts, and facts are stubborn things.

LIST OF PREMIUMS ON FRUIT AND FLOWERS, MINNESOTA STATE FAIR, 1801.

(For rules and regulations see page 100, premium list, which can be had on application to Sec'y E. W. Randall, Hamline, Minn.)

CLASS 55.—APPLES. Open to all.

Lot.		1st Prem.	2nd Prem.	3rd Prem.
1.	Sweepstakes collection. Open to all competitors and subject to all the foregoing rules, with the following modifications: 1st. The fruit need not have been grown by the exhibitor. 2nd. The collection may include any variety, seedling or otherwise, grown in Minnesota. 3rd. Each plate shown must be plainly labeled with the name of its grower. Printed cards for this purpose will be furnished on application to the superintendent	$25.00	$15.00	$10.00

Lot.		1st Prem.	2nd Prem.	3rd Prem.
2.	Peck of Wealthy apples	$5.00	$3.00	$2.00
3.	Collection of 10 varieties of apples, to be judged with special reference to the size, beauty and perfection of the fruit (crabs and hybrids excepted)	25.00		

To be divided pro-rata among all the exhibitors in this lot.

CLASS 56—APPLES. For Professionals.

Lot.		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
4.	Collection (hybrids and crabs excepted)	$25.00	$20.00	$15.00	$10.00	$5.00
5.	Collection of hybrids and crabs, not to exceed 10 varieties	5.00	4.00	3.00	2.00	1.00

SINGLE PLATES.

Lot.		1st Prem.	2nd Prem.	3rd Prem.
6.	Antinovka	$1.00	$0.75	$0.50
7.	Anisim	1.00	.75	.50
8.	Long Arcade	1.00	.75	.50
9.	Blushed Calville	1.00	.75	.50
10.	Brett	1.00	.75	.50
11.	Breskovka	1.00	.75	.50
12.	Ben Davis	1.00	.75	.50
13.	Charlamoff, Peterson's	1.00	.75	.50
14.	Christmas	1.00	.75	.50
15.	Cross	1.00	.75	.50
16.	Fameuse	1.00	.75	.50
17.	Gilbert	1.00	.75	.50
18.	Grundy	1.00	.75	.50
19.	Harding	1.00	.75	.50
20.	Humboldt	1.00	.75	.50
21.	Haas	1.00	.75	.50
22.	Judson	1.00	.75	.50
23.	Kaump	1.00	.75	.50
24.	Longfield	1.00	.75	.50
25.	Lubsk Queen	1.00	.75	.50
26.	Lowland Raspberry	1.00	.75	.50
27.	Maple	1.00	.75	.50
28.	MacMahon White	1.00	.75	.50
29.	Malinda	1.00	.75	.50
30.	Northwestern Greening	1 00	.75	.50
31.	Ostrekoff (true)	1.00	.75	.50
32.	Peerless	1.00	.75	.50
33.	Phebe	1.00	.75	.50
34.	Peter	1.00	.75	.50
35.	Repka Malenka	1.00	.75	.50
36.	Rollin's Prolific	1 00	.75	.50
37.	Sandy Glass	1.00	.75	.50
38.	Tama	1.00	.75	.50
39.	Talman Sweet	1.00	.75	.50
40.	Tetofsky	1.00	.75	.50
41.	Utter	1.00	.75	.50
42.	Walbridge	1.00	.75	.50
43.	Wolf River	1.00	.75	.50
44.	White Pigeon	1.00	.75	.50
45.	Yellow Sweet	1.00	.75	.50
46.	Yellow Transparent	1.00	.75	.50

Lot.		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
47.	Duchess of Oldenburg	$1.75	$1 50	$1.25	$1.00	$0.75	$0 50
48.	Hibernal	1.75	1.50	1.25	1.00	.75	.50
49.	Okabena	1.75	1.50	1.25	1.00	.75	.50
50.	Patten's Greening	1.75	1.50	1.25	1.00	.75	.50
51.	Wealthy	1.75	1.50	1.25	1.00	.75	.50

CLASS 57—APPLES. For Amateurs.

(An amateur is one engaged in a pursuit not as a business.)

Lot.		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
52.	Collection, hybrids and crabs excepted	$15.00	$10.00	$8.00	$4 00	$2.00
53.	Collection of hybrids and crabs, not to exceed 10 varieties	5.00	4.00	3 00	2.09	1.00

SINGLE PLATES.

Lot.		1st Prem.	2nd Prem.	3rd Prem.
54.	Antinovka	$1.00	$0.75	$0.50
55.	Anisim	1.00	.75	.50
56.	Long Arcade	1.00	.75	.50
57.	Blushed Calville	1.00	.75	.50
58.	Breskovka	1.00	.75	.50
59.	Brett	1.00	.75	.50
60.	Ben Davis	1.00	.75	.50
61.	Charlamoff, Petersen's	1.00	.75	.50
62.	Christmas	1.00	.75	.50
63.	Cross	1.00	.75	.50
64.	Fameuse	1.00	.75	.50
65.	Gilbert	1.00	.75	.50
66.	Grundy	1.00	.75	.50
67.	Harding	1.00	.75	.50
68.	Humboldt	1.00	.75	.50
69.	Haas	1.00	.75	.50
70.	Judson	1.00	.75	.50
71.	Kaump	1.00	.75	.50
72.	Longfield	1.00	.75	.50
73.	Lubsk Queen	1.00	.75	.50
74.	Lowland Raspberry	1.00	.75	.50
75.	Maple	1.00	.75	.50
76.	MacMahon White	1.00	.75	.50
77.	Malinda	1.00	.75	.50
78.	Northwestern Greening	1.00	.75	.50
79.	Ostrekoff (true)	1.00	.75	.50
80.	Peerless	1.00	.75	.50
81.	Phebe	1.00	.75	.50
82.	Peter	1.00	.75	.50
83.	Repka Malenka	1.00	.75	.50
84.	Rollin's Prolific	1.00	.75	.50
85.	Sandy Glass	1.00	.75	.50
86.	Tama	1.00	.75	.50
87.	Talman Sweet	1.00	.75	.50
88.	Tetofsky	1.00	.75	.50
89.	Utter	1 00	.75	.50
90.	Walbridge	1.00	.75	.50
91.	Wolf River	1.00	.75	.50
92.	White Pigeon	1.00	.75	.50
93.	Yellow Sweet	1.00	.75	.50
94.	Yellow Transparent	1.00	.75	.50

Lot.		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
95.	Duchess of Oldenburg	$1.75	$1.50	$1.25	$1.00	$0.75	$0.50
96.	Hibernal	1.75	1.50	1.25	1.00	.75	.50
97.	Okabena	1.75	1.50	1.25	1.00	.75	.50
98.	Patten's Greening	1.75	1.50	1.25	1.00	.75	.50
99.	Wealthy	1.75	1.50	1.25	1.00	.75	.50

CLASS 58—CRABS AND HYBRIDS. Open to All.

Lot.		1st Prem.	2nd Prem.	3rd Prem.
100.	Briar's Sweet	$1.00	$0.75	$0.50
101.	Dartt	1.00	.75	.50
102.	Early Strawberry	1.00	.75	.50
103.	Florence	1 00	.75	.50
104.	Gideon's No. 6	1.00	.75	.50
105.	Greenwood	1.00	.75	.50
106.	Hyslop	1.00	.75	.50
107.	Lyman's Prolific	1.00	.75	.50
108.	Martha	1.00	.75	.50
109.	Pride of Minneapolis	1.00	.75	.50
110.	Sweet Russet	1.00	.75	.50
111.	Tonka	1.00	.75	.50
112.	Transcendant	1.00	.75	.50
113.	Virginia	1.00	.75	.50
114.	Whitney	1.00	.75	.50

SEEDLING APPLES. Open to All.

115.	Collection, excluding crabs and hybrids	8.00	6.00	4.00
116.	Collection of crabs and hybrids	6.00	4.00	2.00

A sample of wood, three years old, from the tree bearing the fruit exhibited must accompany the exhibit in the three lots following, and hardiness of tree, as appearing in this sample, shall be considered by the judges.

117.	Fall variety, not sweet, never having received a premium at the Minnesota State Fair	$6.00	$4.00	$2.00
118.	Winter variety, not sweet, never having received a premium at the Minnesota State Fair	10.00	8.00	2.00

Before premiums are paid in this lot exhibits of the same varieties must again be examined and found in good condition (by the same committee, if possible), at the next winter meeting of the Minnesota State Horticultural Society; the apples not having been kept in cold storage.

119.	Sweet variety, never having received a premium at the Minnesota State Fair, of such excellent quality as to make it worthy of general cultivation; either fall or winter	$6.00	$4.00	$2.00

CLASS 59—GRAPES. Open to All.

Must be placed on exhibition by 9 a. m. Tuesday, the second day of the fair.

Lot.		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
120.	Collection	$20.00	$15.00	$10.00	$8.00	$5.00

Lot.		1st Prem.	2nd Prem.	3rd Prem.
121.	Agawam (Roger's No 15)	$1.50	$1.00	$0 50
122.	Aminia (Roger's No. 39)	1.50	1.00	.50
123.	Barry (Roger's No. 43)	1.50	1.00	.50
124	Brighton	1.50	1.00	.50
125.	Concord	1.50	1.00	.50
126.	Cottage	1.50	1.00	.50
127.	Campbell's Early	1.50	1.00	.50
128.	Delaware	1.50	1 00	.50
129.	Duchess	1.50	1.00	.50
130.	Early Victor	1.50	1.00	.50
131.	Eldorado	1.50	1.00	.50
132.	Empire State	1.50	1.00	.50
133.	Green Mountain	1.50	1.00	.50
134.	Herbert (Roger's No. 44)	1.50	1.00	.50
135.	Iona	1.50	1.00	.50
136.	Janesville	1.50	1.00	.50
137.	Lindley (Roger's No. 9)	1.50	1.00	.50
138.	Lady	1.50	1.00	.50
139.	Martha	1.50	1.00	.50
140.	Massasoit (Roger's No. 3)	1.50	1.00	.50
141.	Moore's Diamond	1.50	1.00	.50
142.	Moore's Early	1.50	1.00	.50
143.	Niagara	1.50	1.00	.50
144.	Pocklington	1.50	1.00	.50
145.	Pokeepsie Red	1.50	1 00	.50
146.	Telegraph	1.50	1.00	.50
147.	Wilder (Roger's No. 4)	1.50	1.00	.50
148.	Woodruff Red	1.50	1.00	.50
149.	Worden	1.50	1.00	.50
150.	Wyoming Red	1.50	1 00	.50

SEEDLING GRAPES.

151.	Single variety	1.50	1.00	.50

CLASS 60—PLUMS. Open to All.

152. Sweepstakes Collection. Open to all competitors and subject to all the foregoing rules, with the following modifications: 1st. The fruit need not have been grown by the exhibitor. 2nd The collection may include any variety, seedling or otherwise, grown in Minnesota. 3rd. Each plate shown must be plainly labeled with the name and address of its grower. Printed cards for this purpose will be furnished on application to the superintendent..... $50.00
To be divided pro-rata among all exhibitors in this lot.

		1st Prem.	2nd Prem.	3rd Prem.
153.	Collection (not to exceed 15 varieties) in uniform one pint glass jars. To be accompanied by a statement of the method used in putting them up	$10.00	$8.00	$6.00

The following recipes may be used: For the thick-skinned varieties: Two per cent formaline and 10 per cent alcohol, 88 per cent distilled water. The thinner the skin the more alcohol should be used.

Another: Fill jar with plums and fresh water, and to one pint of water add one-half teaspoonful of salicylic acid.

Lot.		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.
154.	Collection, not to exceed 15 varieties (not in glass; fruit of early ripening may be kept in cold storage)	$5.00	$4.00	$3.00	$2.00
155.	Aitkin	1.00	.75	.50	
156.	Black Hawk	1.00	.75	.50	
157.	Cheney	1.00	.75	.50	
158.	De Soto	1.00	.75	.50	
159.	Forest Garden	1.00	.75	.50	
160.	Hawkeye	1.00	.75	.50	
161.	Mankato	1.00	.75	.50	
162.	New Ulm	1.00	.75	.50	
163.	Ocheeda	1.00	.75	.50	
164.	Rockford	1.00	.75	.50	
165.	Rollingstone	1.00	.75	.50	
166.	Stoddard	1.00	.75	.50	
167.	Surprise	1.00	.75	.50	
168.	Weaver	1.00	.75	.50	
169.	Wolf	1.00	.75	.50	
170.	Wyant	1.00	.75	.50	
171.	Windom	1.00	.75	.50	
172.	Seedling, to equal or excel the De Soto plum, never having received a premium at the Minnesota State Fair	5.00	3.00	2.00	
173.	Pears	2.00	1.00		
174.	Peaches	2.00	1.00		

CLASS 61—SUNDRIES. Open to All.

		1st Prem.	2nd Prem.	3rd Prem.
175.	Ancient Briton blackberries	$1.00	$0.75	$0.50
176.	Snyder blackberries	1.00	.75	.50
177.	Badger blackberries	1.00	.75	.50
178.	Sand cherries or sand cherry hybrids	2.00	1.00	.50

CLASS 62—FLOWERS. For Professionals.

PLANTS.

		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
179.	Collection of foliage and decorative plants	$35.00	$30.00	$20.00	$15.00	$10.00
180.	Collection of green houseplants	20.00	15.00	10.00	5.00	
181.	Collection of climbing vines	2.00	1.00	.50		
182.	Collection of five hanging baskets, one of a kind	4.00	3.00	2.00	1.00	
183.	Collection of coleus	2.00	1.00	.50		
184.	Collection of tuberous-rooted begonias	4.00	3.00	2.00		
185.	Single specimen palm	4.00	3.00	2.00	1.00	
186.	Collection of geraniums in bloom	4.00	3.00	2.00	1.00	
187.	Collection of carnations in bloom	3.00	2.00	1.00	.50	
188.	Vase filled with plants at the fountain in Horticultural Hall	4.00	3.00	2.00	1.00	

CUT FLOWERS.

To be placed on exhibition Tuesday a. m., the second day of the fair.

		1st Prem.	2nd Prem.	3rd Prem.
189.	Collection of asters	$3.00	$2.00	$1.00
190.	Collection of carnations	3.00	2.00	1.00
191.	Collection of roses	3.00	2.00	1.00
192.	Collection of petunias	2.00	1.00	.50

DESIGNS, BASKETS AND BOUQUETS.

To be placed on exhibition Tuesday a. m., the second day of the fair.

		1st Prem.	2nd Prem.	3rd Prem.	4th Prem.
193.	Mantelpiece decoration	$15.00	$10.00	$6.00	$4 00
194.	Twelve-inch basket of flowers	5.00	3.00	2.00	1.00
195.	Pyramid bouquet	3.00	2.00	1.00	.50
196.	Hand bouquet, nine inches across	3.00	2.00	1.00	.50
197.	Bridal bouquet, white flowers	3.00	2.00	1.00	.50

CLASS 63—FLOWERS. For Amateurs.

PLANTS.

		1st Prem.	2nd Prem.	3rd Prem.
198.	Single sword fern	$1 50	$1.00	$0.50
199.	Single foliage plant	1.50	1.00	.50
200.	Single fuchsia in bloom	1.50	1 00	.50
201.	Single geranium in bloom	1.50	1.00	.50
202.	Single begonia in bloom	1.50	1.00	.50
203.	Single hanging basket	1.50	1.00	.50
204.	Single palm	1.50	1.00	.50

CUT FLOWERS.

To be placed on exhibition Tuesday a. m., the second day of the fair.

		1st Prem.	2nd Prem.	3rd Prem.
205.	Collection of asters	$2.00	$1.00	$0.50
206.	Collection of coreopsis	2.00	1.00	.50
207.	Collection of dahlias	2.00	1 00	.50
208.	Collection of everlasting flowers	2.00	1.00	.50
209.	Collection of nasturtiums	2.00	1.00	.50
210.	Collection of pansies	2.00	1.00	.50
211.	Collection of marguerite carnations	2.00	1.00	.50
212.	Collection of verbenas	2.00	1.00	.50
213.	Collection of zinnias	2.00	1.00	.50

CLASS 64—MUSHROOMS.

214. To be placed on exhibition Tuesday a. m , the second day of the fair, and renewed from day to day up to and including Friday following; the exhibit will be judged daily. Premium $40.00
To be divided pro-rata among the exhibitors.

Controlling Apple Tree Borers—The best way to prevent borers getting at the trees is to use common window screening. Wrap a strip about 16 inches high around the base of the tree. See that the lower edge is a little below the surface of the ground. Of course, any borers already in the limbs must be dug out.

A simple seed tester consists of two dinner plates and two pieces of white flannel of about the same size. Dampen the flannel thoroughly and spread a piece on a plate and soak the seeds, count and lay them upon the flannel; spread the other piece over the seeds and cover with another plate. It is necessary only to lift the plate and remove the upper piece of flannel to examine the seeds.

Secretary's Corner.

HAVE YOU MADE YOUR ENTRIES FOR THE STATE FAIR?—If not attend to it at once and not put it off till the last moment. Make entries for everything you are likely to have to exhibit, and then if you are not able later to exhibit everything entered no one is the loser by it. We are to have a great fruit show —if you do your part.

AN EXCELLENT FRUIT PRESERVATIVE.—A preparation of soft water and two per cent of formaline is one of the best known for the preservation of fresh fruit. All kinds of fruit can be kept in this mixture, and they will retain very well their natural color and form. Try this for plums to be exhibited at the state fair or for exhibition at the winter meeting; also for crab apples, etc.

SEND EARLY RIPENING FRUITS TO COLD STORAGE.—You can show at the state fair and the winter meeting everything growing on your place, as all kinds of fruit that mature before that time can be kept without difficulty by gathering after fully grown and before becoming mellow and sending at once by express to cold storage. Gather a few more specimens than actually needed and wrap each one carefully to prevent bruising in handling.

A NEW HORTICULTURAL CLUB.—A number of sensible people in the neighborhood of Constance have organized themselves into a club, the general purpose of which is well indicated by the title, "The Farmers' Horticultural and General Improvement Club of Constance, Minn." They are to hold weekly meetings in the winter and bi-weekly in the summer. The president is Mr. J. P. Ness and the secretary Mr. Fred Johnson. This example could be profitably followed by every community in the state.

OUR NEW BUILDING AT THE STATE FAIR.—The new agricultural hall at the state fair, of which horticulture is to occupy about two-fifths, is rapidly nearing completion and will be ready for the exhibitors on August 10th. The floors are to be all artificial stone, the glass all painted in white to exclude the sun's rays, and the inside walls and all wood work painted also in white. The building is a beauty inside and out, and we are proud to have the opportunity to participate in the "house warming" on September 2nd next. Will you be there to take a part with us?

PROF. GREEN REVISES "VEGETABLE GARDENING" AND "FORESTRY IN MINNESOTA."—Prof. Green is putting in much leisure time this summer in

revising these two popular works, which were prepared originally as text books for his classes in the state agricultural school. Both of them have been very generally adopted as text books in similar schools throughout the country. The changes made in them are so extensive as to require the entire resetting of both books. Large editions of these works have been disposed of, mostly in the northwest, though they are almost equally adapted to all parts of the country. The revision will undoubtedly largely increase the demand for them as it will their value.

A VERY EARLY PLUM.—J. M. Underwood, of Lake City, sent to this office July 27 a seedling plum, fully ripe, of good quality and of large, not extra large, size. In color and marking it closely resembles the Miner plum, of which it may be a seedling; but this seems unlikely as it is so extremely early, and the Miner is of the very latest. Who is ripening a good plum earlier than this?

THE HARDINESS OF PLANTS.—I was much interested last summer in comparing notes with some English gardeners. Along the line of hardiness, for instance, I was told that in central England the ordinary hydrangea, which is so hardy here, was pretty sure to kill to the ground and even to kill out entirely, and that it was not a satisfactory plant on this account. And yet, this was in a section where they can grow a wonderful variety of plants which would scarcely be hardy in southern Ohio. S. B. GREEN.

"CAN EARLY VARIETIES OF APPLES BE KEPT IN COLD STORAGE FOR THE WINTER MEETING?"—Yes, without difficulty. They should be carefully picked by hand to avoid bruising, each specimen wrapped in paper and tightly packed in a box so they can not jar about, and sent at once by express to cold storage, as directed. They should not be allowed to become fully ripe on the trees but be gathered while still firm and hard, as they keep better at this stage than when fully matured. Try this for all early varieties for state fair or winter meeting.

PHOTOGRAPHS OF FRUITS, ETC.—If any of our readers have already or should have taken photographs of fruit trees, orchards, fruit gardens, ornamental trees or shrubs, evergreens, windbreaks, etc., anything that would be of interest to the horticultural public, they are requested to communicate with the secretary in regard to them, as such pictures can be used to good advantage in illustrating our monthly. Photographs of new varieties of apple trees raised from the seed are especially desirable, accompanied by suitable description. What can you send us?

THE STATE FAIR PREMIUM LIST.—For purposes of preservation and convenient reference, the list of premiums offered by the Minnesota State Fair on fruits and flowers is printed in full in this issue. Those contemplating exhibiting or interested in the subject will find it worth while to give this list careful study. Very few of our members but could exhibit something for a premium that is noted in it. The horticultural department of the fair needs many new exhibitors this year. Look the list over and see what you can show, notifying Sec'y E. W. Randall, Hamline, Minn., of your wish and ask for a premium list so that you may study the regulations, to be found on page 100 of the premium list. Send something to the fair.

GROWING AT THE OWATONNA TREE EXPERIMENT STATION.—This station has a large equipment of growing stock, including in all "more than 1,100 varieties of apples, with a goodly number of plums and a few pears and cherries. Of the apples 304 varieties have been gathered in from our most noted and successful experimenters, scattered over the northwest; some from far off Vermont. In addition there are 218 Russian varieties, and, last but not least, there are 590 varieties that have been originated on the grounds." "Among these new seedlings that have borne there are perhaps twenty good sized apples, but the general average is small."

Valuable results may be looked for from this collection in the near future. Call upon Mr. E. H. S. Dartt, the superintendent of this station, when in Owatonna and get him to show you around, not forgetting to take a look at his park, which has been described in a late number of this magazine.

SAVE THE SEEDS, APPLE, PLUM AND BERRY.—We are greatly in need of better and hardier varieties for the North. We can no longer hope to get these better varieties from other regions, they must come from the seed of our own best varieties grown right at home. Reserve a little place in the home garden for sowing such seeds *as they ripen*. Cover with a mulch during winter, and upon removing in the spring the little Minnesotans will soon struggle to the surface and in a short time begin to show such an interesting variety of form, size and color as will surprise the planter.

The Minnesota State Horticultural Society offers a reward of a $1,000 for a seedling apple that will meet the needs of our state for a winter apple. But one can have this prize, but many can have the satisfaction and honor of doing their part in adding to the comfort and resources of our country. Tell the children about this; they can each have varieties all their own, for every seed will bring a new variety that will have a style and color all its own and may be named to suit their pleasure. Children, many of them, have tastes for these happy avocations that only lack the opportunity to develop in order to become most useful and delightful occupations for their leisure thoughts and hours in later life.

CLARENCE WEDGE, from "Farmer."

DIVISION OF FORESTRY NOW A BUREAU.—"On July 1 the division of forestry and three other scientific divisions of the United States Department of Agriculture were advanced to bureaus. This was provided for by the last session of congress, which appropriated for the expenses of the bureau of forestry during its first year $185,440.

"The appropriation for the division of forestry during the year just ended was $88,520. For the year 1898-99 it was $28,520. These figures show how rapidly the forest work of the government has expanded of late, and also how well it has commended itself to congress.

"The change from a division to a bureau, and the larger appropriation, will make possible both an improved office organization and more extended field work. The bureau will be provided with a much larger office force and will be organized in three divisions. But field work, not office work, is what the bureau exists for.

"Several state governments have asked the aid of the bureau. But the greatest demand is that of the Department of the Interior of the national government, which has asked for working plans for all the forest reserves, with the enormous total area of about 47,000,000 acres."—*Mpls. Journal.*

STRAWBERRY PLANTATION OF W. E. FRYER, GENOA, MINN.

THE MINNESOTA HORTICULTURIST.

VOL. 29. SEPTEMBER, 1901. No. 9.

COMMERCIAL STRAWBERRY CULTURE.

C. W. GURNEY, YANKTON, S. D.

(Paper read before the South Dakota State Horticultural Society, at Sioux Falls, Jan. 23, 1901.

In the entire list of small fruits grown for the market there is no one that reaches the strawberry in its adaptability to the conditions in South Dakota and consequent profitableness to the grower. That this fruit can be grown nearly as successfully here as elsewhere has been established, but many are deterred from engaging in this branch fearing the market would be soon glutted. After an experience extending over many years I feel perfectly safe in asserting that there is no reasonable likelihood of such a condition existing in this latitude.

Years ago when just before our fruit was ripening, and foreign berries were selling at a few cents a quart and the market glutted, I looked forward to about the same market for locally grown fruit. This did not occur, and I think never will. As soon as the southern crop was exhausted, the prices jumped up, and the demand so far has been greater than the local growers could meet. I have never sold berries here in Yankton at less than $2.40 a case for twenty-four full quart cases. They have retailed readily for good berries at two boxes for a quarter or 15 cents per single box.

We have only one foreign competitor that is in the way. A berry is shipped in from Oregon, more than a thousand miles, the name of which I have been unable to learn, which reaches us in a condition about as good as when fresh and is of very superior quality. This berry sells beside home grown fruit at the same prices.

This berry has given rise to much discussion in our horticultural societies. Many have wished to get it, but it might be worthless if grown here. This is one of the pronounced peculiarities of this fruit. The same berry which gives the best results in one lo-

cality may be practically worthless a few miles distant under different conditions of soil and culture. There are some exceptions to this rule. The Crescent, Bederwood and Warfield will succeed in nearly every locality and condition with good treatment.

It is not my purpose to go into the details of planting. Any one who can successfully transplant a cabbage should not with the same care have any trouble in setting strawberry plants. There are, however, some points where failures are sometimes made that it may be well to consider. Above all things be sure to get a full stand on the first planting. If not you will not be likely to get one after by patching up.

There is more danger of getting the plants too wet in shipping than too dry. If the former, the crown rots, and the plant is worthless. If received quite dry and in good condition otherwise, wet the roots immediately, handling them a bunch at a time. They are put up in bunches of twenty-five. Be careful and not wet the tops or the crowns. If ready to plant put them all in the shade, out of the wind, and only take out as many at a time as can be planted before the roots get dry. If not ready, the roots should be dipped in a thin mud, not so thick but it will penetrate all parts of the bunch, or a still better way is to wet them and then open the roots and thoroughly sprinkle with dry dust. They then may be safely laid away for a day or two, but generally the quicker a plant is set after received the better.

Some strawberry specialists insist on putting a pint of water on each plant as soon as set. This might do in small plantings, but the commercial strawberry man will not do it. It is expensive and laborious, and not necessary under ordinary circumstances.

We cut off about half the leaves while in the bunch, doing it with a sharp knife, cutting across the top of the bunch. Where we take plants up fresh and immediately reset them we do not practice this.

The commercial strawberry man generally gets two crops, one of plants and one of fruit. These two plantations should never be in the same beds. Keep the plantation for plants separate from that for fruit, as they are handled quite different. For plants it will not be necessary to intersperse varieties for the purpose of fertilizing, or pollenizing. It is better to keep the same varieties as separate as practicable, that the plants do not intermix by running across the rows. These we take up clean in the spring, carry them to the cellar where they are sorted, and all the old plants as well as the small ones are thrown out.

In cultivating this plantation we use no coulter for cutting off the runners, the object being to get as many to grow as practicable.

The plants in either case must be kept clean. We do much work with the hoe.

In the plant plantation we have always put the rows four feet apart and the plants in the row from twelve to twenty inches. This depends upon the variety. Some will cover the whole ground at the last named or a greater distance, while others, like the Parker Earle, make very few and short runners.

We have always planted the fruit plantation the same distance between rows, but using a little more space between the plants, as it is very desirable if good fruit is wanted not to allow the plants to set too close from the runners. Hereafter, however, we shall reduce the distance between the rows in our fruit plantations to three feet. The rows will not be allowed to mat quite as wide, consequently a little less fruit to the row, but more than enough rows to make up this deficiency. This will conserve labor, giving a greater proportion to the cultivator and that much less to the hoes.

A cultivator is used for the fruit beds with a thin, sharp coulter on one side, which cuts off all too rampant runners without disturbing stolons that have caught on the same runners.

This work all being properly done, the next thing is to cover in the fall. We have had occasion to change our mind and practice in this recently. We have not covered till ground was frozen hard enough to bear up a team and wagon, but where the fall is long and interspersed with freezing nights and warm days the foliage is killed and the plants consequently weakened before this time comes. There is no danger of the plants being smothered out any time after they have become dormant if straw is used as a cover. If I were intending to use straw stable manure, which is always advisable, I would either wait a little longer or would first cover rather lightly with straw and apply the other at any time later, even to mid-winter.

I practice covering with straw very heavily. This prevents its blowing off. My plantation is entirely unprotected, situated in a broad valley down which the wind sweeps unobstructed and at times with untiring energy. Still I have no cover blown off. A few spears of straw thrown on the ground will blow away, but it takes a strong wind to blow off the top of a straw stack. The straws interlace perpendicularly and hold it fast. If your cover by any means does blow off you must lose no time in replacing it.

We remove the mulch over the rows as much as is necessary in the spring, after we notice some plants trying to get through, always being careful not to remove more than is necessary.

We have a three inch artesian well and fields so located that they can be flooded from it, but practically we grow this fruit without irrigation. The first year we sometimes use it sparingly but never the second or fruiting year unless it is very early, soon after plants are out of bloom. It is impractical to use it during the picking season. If thoroughly soaked at this time our ground would be soft enough to mire a snipe and the pickers would rebel.

Where we can do so we get girls for pickers. They are more conscientious (at this age at least) and will obey orders. They seldom throw clods at each other, or want to stop and go fishing in a busy time. There are never any leaves or straws in their boxes; they pick them full and generally pay strict attention to business. Boys do sometimes but not always.

Again let me quietly hint to my brother strawberry men, when you go to town for pickers go to the best families. You can get them. It is a healthful and novel experience, and, though they have not been used to much hard work they soon learn it and enjoy it, besides it adds to their little pin money.

Always use full quart boxes and see that they are filled. They should be rounded up so as to be at least full after settling twenty-four hours.

At the last of the season it is well to instruct the pickers to make two grades of berries. Imperfect or smaller ones are kept separate for home use, canning, etc., and do not reduce the price, as they will when mixed with good berries.

We do not get the yields here that they do, or claim they do, in some, perhaps, more favored localities. Perhaps we do not give them the extensive cultivation that is given which produces those phenomenal yields.

I have been in the big strawberry fields of Illinois where they claim those big yields, but, as I estimate and remember it, I have never seen anything better than a field of about ten acres grown by the Gray Brothers, in Yankton, last year. I am told they made a net profit of $1,000.

All nursery stock going into Canada must enter the customs ports only of St. John, N. B., St. Johns, Que., Niagara Falls and Windsor, Ont., and Winnipeg, in Manitoba, between March 15 and May 15, and Oct. 7 and Dec. 7. Entrance at Vancouver, B. C., from Oct. 15 to March 15. All nursery stock will be fumigated at these ports at the risk of the shippers or consignees.

METHODS OF MULCHING AND THEIR COMPARATIVELY VALUE.

J. S. HARRIS, LA CRESCENT.

Mulching of orchard trees is recommended by a number of our most successful horticulturists and more or less practiced by many of them. Some practice it to save cultivation and others for specific purposes. In the latter case if properly done it is in all cases more or less beneficial, but as a substitute for cultivation it is often of doubtful utility and sometimes positively injurious. Besides, to save cultivation it is variously practiced to conserve moisture, to keep out frost and heat and prevent injury from them, and to keep fruit clean and free from grit. The operation is nothing more than covering the ground about the stems of trees and plants and between the rows with coarse straw or barnyard litter, marsh hay, the bottoms of straw stacks or some other material that will not take up moisture from the soil, but will prevent evaporation, thus keeping the soil beneath from drying out rapidly and maintaining it in that moist and equable condition of temperature that is most favorable for the growth of young roots of trees and plants. In the orchard it is an excellent practice with newly transplanted trees and especially for such as are set rather late in the spring. Very many trees in a dry season fail at mid-summer after having had a fair start. From the dry and parched condition of the earth about the roots, surface watering fails to save them, while if they had been properly mulched at the time of planting, when the soil was charged with ample moisture, or, in a case of drouth at time of planting, well watered in the holes, an inch or two of dry, loose soil on the surface and a light covering of litter on top would have carried them through a dry, hot spell with comparative safety. If no other material is at hand, two inches of sand from the road side will answer a very good purpose.

Watering upon the surface after the ground has become hard and dry is most generally an injurious practice unless immediately covered with a mulch, but mulching will do but little if any good applied over a hard, dried out soil, and I do not believe that a heavy mulching is at any time desirable in the summer months, because light rains are all absorbed by it, and it prevents the dampening of the soil below, and many times this is the case through the entire summer. It is also dangerous to use any kind of mulch through which water would not penetrate quickly or that would carry water away from the trees. Where the land is nearly level the best of all mulches is a mellow surface soil of the depth of two

or three inches, made and kept so by cultivating immediately after any rain that compacts the surface of the ground. Where such cultivation cannot be given a light covering of clover or other fresh mown grass will answer the purpose almost as well if applied when the soil is in the right condition and renewed as needed.

To sum up, the best practice seems to be a light mulch immediately under the trees where it cannot be reached with the harrow or cultivator and a frequent stirring of the surface soil between. The mulching to save labor is in most cases a snare and a delusion. The mulching does not hold the moisture as the cultivating will. I consider good and thorough cutivation of the utmost importance in the growing of fruits of any kind, but there are times when it is not practicable to continue it with the small fruits. Strawberries should not be cultivated from the opening of spring until the season of fruiting is over, or the fruit will be a dirty, gritty mess. They should have a liberal mulch of clean straw or prairie hay between the rows until the fruiting season is past, and a light covering of the rows through the winter to help keep out frost and prevent exposure to changes of weather or frequent freezing and thawing. Raspberries and blackberries are better for shallow cultivation in the early part of the season, but when the fruit begins to color the ground about them should be liberally mulched—and the best material for the purpose is green fresh mown clover.

The dust mulch produced by frequent cultivation is the only one suitable for the successful production of grapes in our climate. The only danger from continuous cultivation of bearing orchards seems to be the exhaustion of humus, without which the soil will become hard and compact. This in a great measure can be remedied by the growing of suitable cover crops. Common peas, cow peas or buckwheat, sown at the last cultivation about the first of August, rotated with clover about every third year and to be plowed under shallow when in full growth, are among the best cover crops, but no crop of forage should be removed from the ground.

Mr. J. S. Harris: I would like to tell you why heavy mulching is sometimes dangerous. A year ago last winter a great many trees were root-killed in this state that were heavily mulched. If they had not been mulched so heavily before the fall rains there would have been a good many live roots. They were mulched before the rains came, and as no moisture reached the soil beneath them during the fore part of the winter the consequence was that the roots were killed, while trees near by where the snow only had collected came through in good shape. Where you use heavy mulch in an orchard to save cultivation it is dangerous. I knew a man who put on a half load of barnyard manure every year, and for three of four years he had the reputation of having the finest orchard

around, but after several years the roots came up above the soil in which the trees were planted, he got tired of mulching, and a hard wind came along and his trees tipped over. He had no roots in the soil. I believe in light mulching and wherever practicable having a dust mulch.

Mr. Clarence Wedge: I commend heartily everything that was said in the paper, but I differ from the remarks which followed the paper. The dangers that may come from mulching I think are altogether exaggerated as compared with the dangers that may come without the mulch. The example Mr. Harris gave of the man who mulched his orchard and then neglected it and, as a consequence, lost his trees seems to me to be rather in favor of the mulching. Of course, mulching should be kept on during the year. During the past year we have found that the ground without snow or without mulching is a very dangerous thing. When we get to grafting upon the stocks which Prof. Hansen is recommending to us, those Pyrus baccata, then, perhaps, we can do away with the mulching, but at the present time I consider mulching as the safety anchor for our orchards in these snowless winters. Another point Mr. Harris stated in his paper, that a dust blanket was equal to straw or better. I shall have to express my decided dissent from that. The difference in value between these two classes of mulch was very firmly impressed upon my mind in heeling in a lot of nursery trees in the fall. A portion of the ground had been cultivated, and we had cultivated it unceasingly during the year; it was practically a dust blanket when we heeled in the trees, while another portion which was contiguous was covered with straw. In heeling in the trees we found the soil very dry under the dust blanket, so dry, in fact, that we had to use a good deal of water to heel them in safely, while in heeling in that portion that was covered with straw we found the soil so moist that we needed no water at all in order to carry the trees through the winter. That was my experience with the two styles of mulching.

Mr. J. S. Harris: In answer to Mr. Wedge's first exception I want to say that I used the term "excessive mulching," and I stick to it, because I thoroughly believe that a heavy mulch, especially when the ground is dry under it, is dangerous to the orchard, but a light mulching, with the ground suitably moist under it, if we would apply it every winter about this time, I believe would be a great benefit to our trees. However, if you put on a heavy mulch just before the fall rains take place you have got to pay for what you do.

Mr. Clarence Wedge: In regard to that mulch shedding water. It is a great mistake to place mulch in such a way that it will shed water. We must get away from that idea. The roots of a tree of any size—the roots six or eight feet away from the tree—are just as important and just as valuable or more so, but the mulch should be put on in a level form so as not to shed any water. It should be kept on all the season round. I do not believe in this spasmodic mulching; I believe it should be kept on all the time.

Mr. Wyman Elliot: We have with us today a man who has had considerable experience in mulching, but with material different

from anything that Mr. Harris mentioned in his paper, and I would like to hear from our friend Seth Kenney, of Morristown.

Mr. Seth Kenney: I have an orchard of about 600 apple trees, and 300 of them are Wealthy. Most of them bore a full crop last year, and I mulched with the pressed stalks of the sorghum cane. We had an abundance of that material, and the results were very beneficial. I have a lattice work two and a half feet high around my trees to keep the rabbits and mice away, and it also shades the trunk of the tree, and that, with the mulching, has kept back the trees two weeks in the spring so they would not leaf out so quick as without the mulching. We could easily see the value of mulching, and any one could see the difference. The orchard bore so heavily we had to pick off a good many apples to keep the limbs from breaking, and sometimes they would break the tree. I am very favorably impressed with the value of mulching. In the dry time last summer I pulled away some mulching about the trees and I found the soil was damp, and the apples did not check, and they did not fall from the tree. I had some 300 bushels of Wealthy, and the merchants to whom I sold them said they were the most salable apples they had ever got hold of. I went from one town to another and delivered them, about twenty bushels to a load. I would leave the barrels at a place, and the next time I would take them back with me and leave some full barrels. I picked them and delivered them myself, and I had no commission to pay, and they had them all sold by the time I got around with another load. I found that the ground being moist and in good condition they outgrew their skins a good deal this year, so they did not keep so well as they have kept in former years. I had some eleven inches in circumference. I can recommend the Wealthy as a commercial apple that gives satisfaction to all who purchase it.

The President: How great was the diameter of the circle of that lattice work you placed about your trees, the wire fence you put around them?

Mr. Seth Kenney: The wire was put on lath with little galvanized wire staples and then put around the tree. It was about a foot in diameter. I never had a tree where a borer went below this lattice work.

The President: How far back from this circle did you apply the mulch?

Mr. Seth Kenney: I mulched three feet on each side. The trees were set eighteen by thirty, the rows eighteen feet apart and thirty feet between the trees, and the mulching was put in between, and it worked grandly. When I took my apples to market I was not sorry that I had mulched my trees.

Prof. Robertson: When did you apply that mulch?

Mr. Kenney: I put it on about this season of the year (Dec.)

Prof. Robertson: How thick did you put it on?

Mr. Kenney: We put it on about three or four inches deep.

Prof. Robertson: What price did you obtain for your apples?

Mr. Kenney: First I began to sell them for fifty cents a bushel, and finally I got eighty cents for the Wealthy.

Mr. Oliver Gibbs: I can find nothing in Mr. Harris' paper to find any fault with. I think the keynote of the whole matter was sounded in Mr. Cook's paper when he advocated mulching and cultivation in alternation. I want to call attention to the facts drawn out three years ago from Mr. Somerville. Mr. Somerville has grown famous through his large and well known orchard, and it may be that his success was due to mulching. The question was asked him three years ago when a mulch became necessary. He replied that he put on his mulch late in the fall, and in the spring he turned his hogs into the orchard, and they gave it the alternate cultivation. Many of the older members and some of the younger members know the reputation of Mr. Somerville's orchard, but I set it down on the tablets of my memory at that time that mulching was not doing the work alone, but that it was done by mulching and cultivation in combination.

Mr. A. D. Leach: I am rather an enthusiastic advocate of mulching myself, although I do not believe that too heavy a mulch should be applied. I never put on a mulch so thick that it will not wet through in a good shower. I have been raising apples in Minnesota for thirty years in the same way. I set out in 1881 a Wealthy orchard of thirty trees and succeeded in obtaining some apples. Then came that hard winter of 1884-5, and the cold killed them in such a manner that they had to be cut back. Those trees sprouted up until they have become large, thrifty bearing trees today, but the shape of them prevents cultivation. They are set 16x24 feet apart. They cover the whole ground and the limbs branch out not more than a foot or two above the ground. They spread over the entire ground, and it is just barely possible to go through with the wagon, but no more. Now the question arose what to do with those trees. We could not cultivate them, and I did not know what to do. About six years ago they showed signs of weakness. I had not manured them any, so I went to work and fertilized them with about a wheelbarrow load of manure about each tree. I had the orchard in clover and instead of taking it off the ground I spread it around each tree over a space of about six feet. I let it lie there until the next spring when it was quite thoroughly rotted, and the next spring, instead of turning in the hogs, I took a six tined fork and went around the orchard digging up the ground. When summer came again I put on another mulching of clover and put on some manure the next fall. Next spring I treated it again in the same way I did the preceding spring, and I think I now have as thrifty and nice and well bearing an orchard as can be found in the state of Minnesota. I harvested this summer between 150 and 175 bushels of extra fine Wealthy apples, and nearly all of them were of a good or medium size. In cultivating young trees I am in favor of cultivating around and up to the trees and keeping on a good dust mulch. If the orchard gets too big I am in favor of mulching and forking in the manure, when spring comes taking a fork and digging the manure well into the soil.

Mr. R. A. Wright: All the discussion so far has been upon the apple. In regard to small fruits I want to say that I am in

favor of mulching the raspberry and the blackberry. Two years ago I mulched a half acre with straw and cultivated another piece three times a week for two months. I do not think I missed once except we had a heavy shower of rain. It was very dry two or three years ago in July and August. I found that the blackberry field that was mulched with straw gave me very much better returns than the other field that was cultivated. When I dug into the soil below the surface of the cultivated ground I found it dry, and in stirring the soil great lumps would come up, but under the straw when I dug in with a fork I found the soil mellow and loose, and it seemed to me the straw kept the soil in better shape than did the dust mulch, and if I had to make a choice between cultivation and mulching I would mulch my berries every time.

Prof. Robertson: I want to make one assertion that may be disputed, but I hold it is true. Everybody said that the proper time to mulch was in the winter, and I say the proper time is about the last of June. Put on your mulch right after it rains and then you will get the greatest benefit.

Mr. Wyman Elliot: What would you do in a season like that of 1900 when we had no rain for eight months?

Prof. Robertson: That is just when you will retain the moisture that is then in the soil. Now, if we had gone to those old straw piles and taken the straw that was allowed to go to waste and put it on the ground after we had done some of our cultivating, then we would have found that it kept the moisture there during the summer. When you do not get the rain after plowing then it is making its greatest draft on the soil. So I think if the ground had been mulched with straw you would have found throughout all this summer the same conditions existing as described by the gentleman who just spoke, that under that dry straw where no rain had come you would have found a nice moist soil. Where you attempt to keep your dust blanket you must go around every day to keep it in nice shape, while this straw will serve as a blanket to conserve the moisture for two or three months during the summer.

Mr. R. H. L. Jewett: I was requested to add a word or two to the last paper that was read, and we have fully discussed the next paper under this one. In the cultivation of our grounds we have used the dust mulch almost exclusively. I was led to look into this question somewhat upon observing the effects upon a grove of trees we had that were naturally mulched with leaves and weeds. I thing that many of our trees, large and small, show the effects of the drouth, and I found upon investigation that nature had provided this mulch and the roots came close to the surface. We noticed the effect upon the forest trees, and the trees we planted in the orchard we set pretty deep. We planted them about twenty-four inches deep and tried to get a good growth of roots as far below the surface as we could and then kept on a dust blanket. If we kept a straw mulch on we would produce the conditions found in the grove, and that same mistake continued for a year or two would leave the roots of our trees exposed to the sun. We are trying an experiment. We have one row of trees covered with straw six feet

on either side of the trees, trying to give them the natural forest condition, the same that our grove has, and the other row we mulched with a dust blanket. Both of these rows produced apples this year. I think the better apples were on the trees that were cultivated and more of them. My theory was that we would encourage the roots to keep too close to the surface and so would become exposed to the frost and to the sun.

Mr. Jno. Freeman: I wish to ask a question for information. What do we mean by a dust mulch? How often must we cultivate from the first of May to the first of November? Must the cultivation be continuous, and how often must it be done to make what is called a dust mulch under any plan of cultivation? We were taught in my youth and early age that we must not cultivate after a certain time or we would cause injury. Now I would like to get all the information I can on this point of the dust mulch.

The Secretary: We all know that our president is a very modest man, and as he is a modest man he is afraid to announce to you that he is next on the program with a paper that treats expressly of the subject about which Mr. Freeman desires information. Now I think it would be well for him to read his paper before Mr. Freeman's question is answered and perhaps that will solve the problem. (See index for paper entitled "The Dust Mulch in Minnesota," by W. W. Pendergast.)

NURSERY CULTURE OF THE APPLE.

J. P. ANDREWS, FARIBAULT.

In view of the fact that apple trees have root-killed four or five different winters during the past thirty years it is a good precaution to plant the very hardiest seed obtainable.

Where stocks are grown on a commercial scale, the common apple seed has been almost invariably used. Though French crab seed is used some it is probably no hardier, if any different, from our common apple seed. This year we saved a bushel or such a matter of the seed of the Siberian crab, Early Strawberry, Virginia, and some others and shall continue to use the Siberian hereafter on account of its hardiness.

After separating the seed from the pomace it should be planted in new, rich, deeply plowed, subsoiled and thoroughly pulverized ground in the fall or early spring. If not planted till spring the seed should be thoroughly mixed with sand in the fall and remain out during winter where it will keep moist and freeze.

After growing one season, take up and pack away in the cellar in the late fall and graft during the winter, care being taken to keep the cions, stocks and grafts packed in sand or some material that will keep them cool and just moist, until they can be planted out in early spring.

To have good healthy apple trees they should be grown on elevated land, where the range of temperature is not so great as on low land, and on clay loam, where the wood will ripen early in the fall, and on clay subsoil, that will retain moisture. The ground should be plowed deeply and subsoiled in the fall; then in the spring pulverize thoroughly to the depth of ten inches or more and plant the grafts six or eight inches apart, in rows four feet apart.

Cultivation should begin as soon as planting is finished and repeated at least once a week through the growing season, and as much oftener as the ground gets in good condition to cultivate after each rain. If very shallow surface cultivation is given during the fall, so that the ground takes up and retains the fall rains and early melting snows, it will probably prove a good protection against root-killing—or late crops of oats or buckwheat may be grown to cover the ground to protect from root-killing.

The first year there will be no trimming required if all but the strongest shoot is rubbed off when they start growth in the spring.

Cultivation the second year should begin as early as the ground will work and continue through the growing season, as before, using more horse and less hand work as the trees get larger.

Pruning the second year should be almost nothing, simply cutting back any injured tips to perfectly sound wood and rubbing the buds off the bodies from the ground up to where the top is to be formed.

At the close of the second season the trees will be in nice shape for transplanting in the orchard, with a good top one year old, a good body two years old and a fine root three years old, that can be lifted out with almost the entire roots after the tree digger has loosened the soil around them. The trees will stand from three to six feet high, depending on the varieties, the season and the care.

But if these trees are calculated for the market they will have to be headed back in the spring and grown a year or two more, for the average planter wants more timber in his trees.

During this last year while you are engaged in tree culture you should also be cultivating the acquaintance of a tree man to sell them, and if you could hear him talk while doing his part of the work you would probably feel well repaid, and it may be all you will ever get for your four or five years of hard work growing and packing them for him.

Mr. J. S. Harris: Generally a nurseryman starts in with the idea that by using our crab seeds for root-grafting stocks, it makes the best stock to use for his purpose. I will just cite you one instance. E. S. Wilcox, of Trempeleau, Wis., one of the best fruit

men in the northwest, but who is not now living, got that idea in 1873, after that hard winter, and thought the crab was the thing. He secured all the crabs he could get hold of and saved the seed and went to propagating trees on crab roots. His nursery proved a failure, and the originals planted were more or less a failure. The crab root is a success for grafting upon it the crab cion. The only success Mr. Wilcox met with was with the Utter and the Astrachan put upon this root, which grew more rapidly than upon the apple root, but after four or five years they were all toppled over. The only success he had was to graft the crab upon the crab root and top-work other varieties upon the branches, and whenever he found varieties congenial they were a success. I bought a good many trees from Mr. Wilcox on those crab roots, and some of them lived for seven or eight years. The crab root to use to make a root-graft is not reliable for a great many of our varieties. I believe that the road to success—if I lived in Dakota and had to have those roots I would make a dwarf tree—but the road to success for the general nurseryman is to secure seeds of the hardiest varieties as far north as he can secure them, and then you will get something into which nature has put the germ of a little more hardiness.

Mr. J. S. Park: I have had some such experience as has been spoken of here, and I lay my failure to some other things than have been assigned by Mr. Harris. Perhaps it was from the cause he speaks of. I sent a good many years ago to Mr. Whitney, of Illinois, of No. 20 notoriety, and bought a lot of crab seeds. I sowed those seeds, and when they were grown enough I took them up and grafted them, using some seventy or eighty varieties of apples, such as the Ben Davis, Baldwin, Northern Spy and enough others to make some eighty varieties, and all of them died. I think I could have found a few, such as the Briar Sweet and some of those varieties that did live, but I laid the loss of them at that time to the fact that I got the seeds from the south. I had an idea if I had got northern seeds I would have done better.

Mr. C. G. Patten (Iowa): This I consider a very important question for the horticulturist of the northwest to consider, and as I have had considerable experience along this line I wish to rise thus early in your session to say a few words. As Mr. Harris has said, and according to my experience has said very truly, any one who relies upon the seedlings of the whole root of the yellow crab, or any of that type of crab, will meet with utter failure. I do not remember whether it was in one of the Minnesota papers I made a report a few years ago in regard to my work, but I will briefly state it here. After the winter of 1872-3, as you know, the roots of our trees were terribly killed all over the northwest, and the following summer a large quantity of seed of the cherry and large red and yellow crabs was planted, and the people planted the seed with a great deal of courage. I tried at least seventeen or eighteen varieties of the apple, as well as the Hyslop crab and one or two others that my memory fails to catch just now, and I tried that on a very extensive scale. I grafted the first year, I think, at least 30,000. For the first two years many of those trees apparently prospered;

they grew more vigorously than anything on the common seedling roots, but at three or four years old they began to show failure in vigor. The vigorous roots succumbed, and on many trees the root was dwarfed to a single stem. I tried it for two years, grafting at least 70,000 crabs; perhaps not quite as many as that—but the result of my experiment was an utter failure. There were a few trees, of course, that did better than others, but the result, as a whole, as I stated, was a failure.

Mr. Harris: As I remember, the Wealthy did better than any other variety worked in that way.

Mr. Patten: The Wealthy and the Saxton did the best. Now, I believe if we would go a step farther and use the seeds of such hybrids as the Minnesota, Briar Sweet and the Whitney No. 20, that are really hardy and represent 75 per cent of the apple, we would make a forward step. There is no question in my mind, because I have demonstrated the fact by planting Briar Sweet and Whitney No. 20, and they have produced seedlings fully equal in hardiness to the first cross of the Siberian with the apple and without their defects. I think herein lies the road to improvement of our stocks with the apple.

The President: Do you think anything of advantage can come from this double grafting?

Mr. Patten: No, sir; I do not believe that any advantage is derived from double grafting with the true Siberian stocks, but there might come some advantage by selecting these best seedlings and grafting them six inches or a foot above the ground, giving to the root a more even balance with the top. There is a great deal in that. In my experiments with top-grafting the crab my attention was first called to it on Mr. Tuttle's ground, where he had the Walbridge grafted scarcely two feet from the ground on those Siberian crabs, and in my own experience later on in grafting on the stem of the Siberian I found if a variety would not succeed when grafted on two feet or three feet of the stem it would not succeed if grafted in the limbs of the trees, and they would nearly all finally blow off.

Mr. J. S. Harris: I would suggest for the benefit of the nurserymen who want a crab seed that there is nothing better than the Dartt's Hybrid, and they bear a striking resemblance to the original, and I believe they would make a good seed for the nurserymen to use for stocks.

Prof. N. E. Hansen (S. D.): In Bulletin 65 of the South Dakota Experiment Station, on root-killing, I introduced two points but they are both in the experimental stage as yet. I must insist that from all my experience and from what I have been able to learn, notwithstanding the experience of Mr. Patten and Mr. Watrous, I must insist that that piece root-grafting will not do for several reasons. Now, if you bud on the ground so that everything is below the ground, you are going to get a smaller tree, but I think it would be a better tree than you could get by piece root-grafting. I got hold of the German experience since I published the bulletin, which is, that the tree will be intermediate in size between the ordinary dwarf tree and the ordinary tree, hence it may be preferred for severe situ-

ations or where root-killing is apt to cause trouble. They are desirable in certain situations where other trees cannot be used. I want to insist that you do not do any piece root-grafting on Siberian stocks in the nursery, but bud on the stocks or do crown-grafting, which is practically the same thing. It must be understood, from the very beginning, in all our discussions, we should state whether it was piece root-grafted or budded.

Col. C. L. Watrous (Iowa): It is certainly not any experiment where it has been tried, ground-grafting and budding and then planting in the orchard.

Prof. Hansen: I do not know of any in the United States. I do know it has been done in some instances in Germany and in the northern part of Russia.

Mr. S. D. Richardson: I am a nurseryman and have had some experience in this root-killing business and have seen it in a good many orchards in my section of the country, and as far as I know it is the nurseryman that stands the brunt of the loss by tender stock root-killing. After the tree gets large enough to go out of the nursery and stand for itself, if it is properly cared for there is no danger of root-killing, and in my experience since 1885 I have never had a large sized tree root-killed. I have lost lots of trees one and two years old that have been transplanted, and I have lost them by root-killing, but I have never lost any by root-killing where the ground was covered. Further north there may be danger, but where the ground is covered I do not believe there is any danger of root-killing. I have had black walnut trees root-killed; I lost a great many by root-killing. On a patch of ground that was clean I lost every black walnut that was on it. Bare ground will kill young stocks.

Col. C. L. Watrous (Iowa): It seems to me the sum of all this is that whoever attempt to try to raise a nursery of apple trees on the Siberian pyrus baccata stock, whether it be Russian or otherwise, is treading on extremely thin ice, and his experiments should not involve more money and time than he is able to lose. I have been watching Prof. Hansen's experiments for some time and noted what he put forth in a paper that contained many excellent things. One of his statements was that the day of piece root-grafting in the northwest was practically obsolete. If we could succeed by his plan whereby root-killing could be avoided we could afford to take up something new, but if we go into it on a large scale it may be at a loss to the nurseryman and to the planter of the trees, and it ought to be gone into very carefully and proved in some way at the state experiment stations, and that for a number of years, until the matter has been decided, until it has been fully decided. There is one thing that has not been spoken of here, and that is, that some good success has been had in propagating our common apple tree on the crab, on this same pyrus baccata, that is grown up to be five or six years old. The growth of the current year is used as a scion. Mr. Williams, of Nebraska, told Prof. Craig and myself that that was the only way in which he had success, and he puts it up a foot or two from the bottom of the tree; but he says in his experience the one thing you must not fail to do is to allow the crab tree to have its own top. If

you wish to propagate or grow that as a side issue you can do so. If you cut the top of the crab and undertake to make a top out of your new apple you have organized failure then and there.

Prof. Hansen (S. D.): To look at the question from the standpoint of the whole northwest I think it can be put in this way, that in a very large part of the country root-killing comes only once in a generation or two, and the people need lose no sleep on that account. In Minnesota and the north root-killing comes oftener, especially along the west line of Minnesota, where there is little snow. There you are forced to investigate the subject more closely. Then as you go farther north in North Dakota and the northern part of Minnesota, root-killing is a factor they have to deal with every winter, and then what are you going to do? All the cultivated apple stocks that I know anything about kill every winter, seedlings and the rest. We have to find something that will stand the rigors of that climate, and so far as I can see I do not know of anything else to try except the Siberian. With us we get the very severest freezing when the ground is perfectly dry and bare.

Mr. S. D. Richardson: If we have our ground clean and bare we get root-killing every time, but if the ground is covered in any way the roots will not take any injury. We do not need to have the bare ground unless we want it. If it has a protection of weeds it is all that is necessary.

Prof. Hansen: Perhaps the only thing to do is to grow weeds. The whole thing is still in an experimental stage. We have to abandon the ordinary apple stocks in certain portions of the northwest. What are you going to do when you get into this severe section? How are you going to grow apples where you have no snow at all when severe freezing comes, and you are just as liable to get 40 degrees below as you are to get 10 below, and either will do the business with no snow on the ground. In Iowa root-killing comes so seldom that it is hardly considered a factor in the business. I am firmly convinced that in the far north, north of the northern Iowa line and in northern Minnesota and in North Dakota and in a portion of South Dakota we have to be content with dwarf trees only two-thirds the size of the ordinary apple tree, and have to keep them cut back to keep them in dwarf shape. It is not commercial stock we talk about; what I mean is the yellow Siberian for the far north where root-killing has to be taken into account every year. That is what I am speaking about. The whole thing, however, is still in the experimental stage.

Mr. C. E. Older: There is a nurseryman in our part of the state who says he does not fear the first year in the way of root-killing. He runs a furrow on each side of the row of seedlings and then takes a hoe and covers them up, but the second winter gets him. Two years ago he lost twenty thousand.

Prof. E. S. Goff (Wis.): The gentleman on my right made a statement which surprised me very much. I understood him to say that his experience in root-killing was limited to the nursery, that after the trees were transplanted he no longer feared it. That is a very different experience from ours at our place two years ago. At

the experiment station in Wisconsin we lost two-thirds of our trees by root-killing.

Mr. S. D. Richardson: Was the ground bare?

Prof. Goff: No, it was covered.

Mr. Richardson: I have never known a tree to be root-killed where the ground was covered.

Prof. Goff: I have. In the vicinity of our experiment farm there were Duchess that had stood twenty years or more that root-killed, and one died this past summer. I had native plum trees, Americana plum trees, that were mulched six inches deep with marsh hay, that root-killed, only one or two of them to be sure, but to me it is clear that in the nursery is not the only place of danger. In southern Wisconsin we are liable to have trees root-killed long after they leave the nursery, and I find on reading our early horticultural reports that one or two other winters are reported that have done very serious damage by root-killing. It seems to me at whatever stage this experimental work of Prof. Hansen's is at this time, it is of supreme importance to know that we cannot depend upon our common stock for an apple in southern Wisconsin, although we may get along twenty years without such a winter, and then we may have a winter that will take out whole orchards.

Mr. C. G. Patten (Iowa): I think I can answer Prof. Hansen's question, at least to my own thorough satisfaction, as to what he should do and what others should do in the dry climate to the west and northwest of us, as our horticulturists all know to be the conditions in Minnesota and the Dakotas. As I said before, I think I have proven on my ground that even fourth hybrids from the Siberian will produce just the tree that Prof. Hansen needs and that we all need, and our attention should be drawn toward the observation of such trees, and we should grow such trees to graft and grow the seedlings of such trees. Now, I believe we can grow varieties from the seeds of such trees, in the way I mentioned, that are far better adapted to the purpose that Prof. Hansen desires than we can get from the small Siberian, because they are so unadapted to the apple that he can never tell when he has a hundred or a thousand seedlings what they are going to be worth until he has experimented with them, and that would involve a great loss. In my mind there is no question but that we can grow from the fourth hybrids seedlings that are fully as hardy as the Siberian.

Mr. D. F. Akin: There is one question that has not been considered. Now, all the experience that has been produced here has assumed that the roots of the apple trees were killed by the hard winters. My idea about root-killing is that it is not so much freezing as it is the drouth that does the work, and I would like to know whether any of these gentlemen have a record of the temperature and the amount of rainfall at the time or previous to this root-killing. It is certain if the tops of the trees die the roots will, and if the temperature and the amount of rainfall are the same for each year in our section it may be it is the temperature which does the business. Several years ago we had a winter the February of which was very cold, some two or three weeks below zero weather, the thermometer

sometimes 34 to 36 below zero, but on inquiry among horticulturists throughout the state it was found that their apple trees were not killed. They said it was on account of the water. The limbs were covered with ice and snow, and the temperature was as low as it ever goes, but no root-killing or any bad effects were noticeable in the apple trees. I would like to know if any of the gentlemen have correct records of the temperature compared with the amount of moisture in the soil. Several years ago a neighbor of mine had a row of soft maples set out, and the drouth came on and was so severe that the water in the well that supplied them went down eighteen feet, and every one of those soft maples died, and almost every poplar, or what we call shallow rooted trees died, while those with a tap root, like the oak or the apple tree in its natural state, or those where the seed was planted, all remained. And so we found that those apple trees with the tap root would not kill, but every surface rooted tree would kill. If any gentleman has tried this experiment or noted the difference between the temperature and moisture, I would like to hear the result of his investigation. I recognize the great trouble caused by root-killing, but I think it is done by the drouth instead of the temperature.

Prof. E. S. Goff (Wis.): In our case we had an accurate record of the rainfall and the temperature. The lowest temperature in our orchard—and the record was taken just at the top of the hill only a few feet distant from the highest part of our orchard—the minimum temperature was 27½ degrees below zero. During the autumn the rainfall was slightly less than normal, and during the winter we had almost no rain before the cold snap in February. There was no question but what the roots were killed in our case. Many of those trees leaved out in the spring and in most every case they leaved out at the terminal bud. Furthermore we dug down in a number of cases to note the condition of the roots, but we found that most of the trees had lost their roots, and most of those that were not killed had lost their shallow roots. Strange to say that those trees that had only one or two main roots left lived through and have borne since. There is no question but what it was the roots that failed. It is also true that while the surface soil was wet enough for garden purposes when we got down three feet deep the ground was entirely dry and had been so throughout southern Wisconsin for more than two years, since the dry summer we had four or five years ago. I think the ground has become wet down deeper, but this summer we have had only three feet of moist soil. Those were the conditions under which root-killing occurred in our experience.

Mr. J. S. Harris: In all my experience and observation I have never known any bad cases of root-killing where there was ample moisture in the soil to a depth of three or four feet. In the winter of 1872 we had no moisture in the soil, but in January the ground was wet down about a foot. That winter I lost all my orchard except, perhaps, a few Duchess. I also lost my vinevard, and the vines that were covered the deepest killed the worst. Three or four years prior to 1872 they had a great drouth in Wisconsin, down in the vicinity of Janesville and Whitewater, and the killing of nursery

stock was greater than ever occurred in Minnesota or northern Iowa. For a depth of four or five feet from the surface there was no moisture in the ground. I do not think there is any danger when the soil is moist, and I have heard of trees killed deep in the ground just as frequently as where the roots were on the surface. I don't care if half the roots get on top of the ground; that is the reason I plant shallow.

Mr. Wyman Elliot: In Mr. Patten's remarks he spoke of fourth hybrids. I would like to have him give us an explanation of that term.

Mr. C. G. Patten (Iowa): I mean starting with the old cherry crab and the small yellow crab the next generation was the large red and the large yellow crab, the next was the Transcendent and the Hyslop and the next the Whitney No. 20 and the Briar Sweet. They are the second, third and fourth generation from the Siberian crab as we had it in this country. There are but few of the fourth generation. I do not think I made myself quite clear in that matter. I have the fourth generation removed from the Siberian seedling, a fine appearing apple, fully as large as the Fameuse, and I believe such a seedling root-grafted on the stock I have spoken of, root-grafted with a short root and a long scion set deep in the ground,—I believe a body on that stock would meet Prof. Hansen's requirements.

The President: I think it may do to give out as a subject for thought, that I find that the little yellow Siberian crab, the pyrus baccata, is hardier—(some one said it was no hardier than some of the hybrids) I find it is hardier than any other tree in Minnesota. I do not care what tree you select, the oak, elm, hackberry, take twenty of the hardiest in the most trying situation you can find and put the little yellow Siberian along side of them, and that will live when all the others are dead. I have some now that have never taken any injury at all that bore twenty bushels of apples this past season. I have no tree that comes near (the ash comes nearest to it) that will stand in the same situations. They never blight. There is nothing wrong about them; they never root-kill at all. What is there about the root of this yellow Siberian crab that the roots of other apples do not possess that renders them immune to all these troubles that strike the other apples, that makes them ironclad? Examine those roots and see what there is about them that makes them strong and vigorous under all circumstances.

Mr. Oliver Gibbs: How many present have found the pyrus baccata blighting badly where it evidently did not take the blight from some other variety?

Mr. J. S. Harris: I have one that is not within fifteen or twenty rods of any other tree, but it blights every year.

Mr. Gibbs: I will put the question in a different form. How many have known it to blight? (A few hands were raised.)

The President: How many have known it to root-kill? (No hands up.)

Mr. S. D. Richardson: The most serious form of blight is in the bud, as far as my experience goes with the yellow crab. It is inclined to blight in the bud and die.

The President: The place where mine are is the most trying I know of. Absolutely no other apple tree has succeeded in that situation. It is a black soil, the bottom of an old lake, a coarse bottom with clam shells and cobble stones all the way down to the hard pan, twenty to thirty feet.

Mr. Oliver Gibbs: How many have found it not a bad blighter? (An almost unanimous show of hands.)

Mr. C. G. Patten (Iowa): I have not found it a bad blighter.

Mr. H. F. Busse: I grafted some in 1885, and they grew along for three or four years; I planted them alongside the Whitney No. 20, the Wealthy and the Martha crab, and I think it was the fourth year after planting they blighted so it killed top, root and everything.

Mr. Frank Yahnke: When you speak of the pyrus baccata it is like speaking of the Prunus Americana. Riegel speaks of a number of them. The true Siberian is about as big as a currant. I have tried to get some light on this subject as to whether it is a blighter or not, and I find it is not as bad a blighter as a great many other crabs that might be mentioned. The question is whether to have blight part of the time or root-killing all the time.

Mr. L. R. Moyer: Is not the Tonka one of the varieties of the pyrus baccata?

Prof. Hansen: Yes, I think I should call it an improved baccata. The only way you can tell the difference between the pure Siberian and the mongrel Siberian is that the true Siberian has a smooth calyx. It is the same way with plums; you go far enough south, you get the Chickasaw plum, and in the north you get the Americana plum. With the apple in Asia it happens the same way. In the south you get the pyrus malus, and in the north you get the pure crab. There is a large part of Russia and Europe where they intermingle, and they get a sort of mongrel type. It is neither a pure crab or a true apple; it is half and half.

Mr. Clarence Wedge: I realize that this subject of root-killing is a very live one, at least to the nurserymen. So far as the ideas advanced by my neighbor, Mr. Richardson, are concerned, while we are generally on good terms, I desire to combat some of his ideas that root-killing is not prevalent in our orchards. I do not know how it is in his county, I know he has a different soil, but in our county the orchards have suffered very severely. You remember my friend, Mr. Freeman, speaking of an orchard that has been entirely killed. It was my lot to go through that orchard some time ago, and it is my opinion that they died from root injury. As regards a cover crop of weeds, buckwheat or some other such cover crop being a protection against root-killing, I do not find it so on my place. Last winter I lost very heavily of all ages in my nursery, one, two and three year old. A large part was protected by the most abundant growth of buckwheat I have ever seen, and yet I lost two-thirds of my trees. It was so all through the county, both in the orchards and nurseries. Regarding the inducing cause of root-killing, I know that in a dry season there is much more danger of root-killing than in a reasonably moist season, but we must take conditions as they are, and the average of every year in this country is

that it is always a little drier than it should be in this climate; hence we have root-killing more than we ought to have; in fact, we have root-killing almost every winter. On Mr. Kimball's place there was severe root-killing where there was a very heavy growth of weeds.

Mr. Wyman Elliot: What is the soil?

Mr. Wedge: Our soil has a yellow clay subsoil. It is a glacial formation. The surface of the soil is a clay loam, with a good yellow clay subsoil. No gravel, nothing of that sort, a very retentive soil. A year ago this past winter my chief loss was where the soil was particularly moist, where the snow had happened to blow off and given an exposure. There was a reasonable amount of moisture in the soil generally, and it proved to my mind conclusively that a reasonable amount of moisture in the soil was not a sure preventive against root-killing. But that was a low temperature without any cover.

I want to ask Mr. Patten this question: I am somewhat inclined to be taken with this fever of hardier stock, and it occurs to me, as near as I can learn, that there has been no experiment tried that would exactly combat Prof. Hansen's idea that trees budded at the surface, Siberian stock, would not make good union and good roots for our common commercial varieties. Mr. Patten knows there is something peculiar about the collar. For instance, you can put the common wild plum at the surface of the ground on the collar on the little sand cherry, and it will make a very passable job, but if you put the plum up six or eight inches on the sand cherry it will fall over.

Mr. C. G. Patten: Will it be fruitful when it makes a union?

Mr. Wedge: Yes, I have found it so. The trees will make a good union at the collar but not above. The question I want to ask is this: Has this experiment of Prof. Hansen's ever had a trial in the United States?

Mr. C. G. Patten: I think it has. I think in our experiments in top-working that question has been practically answered, and that, as Col. Watrous has said, any experiment of that kind is only an experiment and should be so regarded. I think it has been demonstrated from the fact, as I said before, whether you graft low down, below the ground, or whether you graft two, three or four feet up on the Siberian crab, on both we find that while one Siberian will unite three feet from the ground very nicely with a given variety of apple, another variety placed upon that Siberian will not unite, and you must place that down within a foot of the ground, and the reason it will not do to place them down upon the ground I substantially stated before. There is a growth going on continually between the roots and the scion, and if there is so wide a difference between the root and the scion it will certainly dwarf the root and dwarf the scion, and if the top is dwarfed it will render it unfruitful, certainly on my ground. Now, to show you that it will not do to grow orchards in this way, I will give you an illustration that came under my observation and in my own experience in producing seedlings from one of the Hesper hybrids, a large hybrid. I grew

an apple that I sent out as the largest hybrid, as large as the Wealthy. I had plenty of Duchess trees at that early time, and I wanted to increase this variety, so I budded a large number of Duchess trees just above the collar with that apple. It did very finely, indeed, for four or five years, then those trees one after another began to die, as has been remarked here before about the Siberian dying. I could not tell the cause, but they simply failed and died, and nearly all of them passed out. So I think we have top-worked enough to know that we do not know a thing about the Siberian until we have proven it. I have sent to the experiment station for trial a few scions of the Briar Sweet that I have full confidence will meet the demands of a more rigorous climate than we have here.

Mr. Frank Yahnke: How old are your oldest trees top-grafted, of any kind?

Mr. Patten: I have some that have been grafted twenty years.

Mr. Yahnke: Are they doing well?

Mr. Patten: Some are, and some are not.

Mr. T. E. Cashman: Is it not a fact that where you have orchard trees and your nursery goes into winter quarters protected by a heavy mulching of snow that the trees come through without any danger? That is the experience I have had, although limited, that where the young trees or the orchard are well covered with snow or mulch no damage comes to the roots. Two years ago I had a large setting of grafts on Siberian roots. I had no buckwheat protection or any kind of cover. In January came a thaw of four inches, and immediately after that thaw I examined the trees, and I found every root in this ground where it had thawed had been killed. while below the thaw the roots were all right, and at certain corners where there happened to be a good covering of snow the trees came through uninjured. Last winter the trees were protected with buckwheat, and we had this same thaw, and then it froze up and the thermometer went down to 20 degrees below zero, and while at our place it did not get quite as warm as it did further south we had more snow. I found where the snow staid on the ground I did not lose any trees, but where the snow thawed off I lost the trees. I also found this past summer that where the orchard trees were thoroughly mulched the trees came through in good shape and showed no signs of injury. While these gentlemen who are running the experiment stations are experimenting with these Siberian crabs, the pyrus baccata, how can we bring our trees through the severe winters? In dry falls I mulch heavily about this time of the year, and if necessary put a wagon load of manure around the tree, and although I may have to take it away in the spring, I believe we can protect our apple tree roots by giving them a sufficient covering to prevent thawing and freezing.

THE CAMPBELL SUBSOIL PACKER IN SOUTHWEST MINNESOTA.

O. C. GREGG, LYND.

We write definitely concerning this packer as adapted to the average conditions upon the prairie in southwest Minnesota. We also write cautiously, because our experience with it has not as yet been extended enough so that we feel sure in our own minds as to its intrinsic worth under the average farm conditions.

Before we can have a good understanding of this matter, we should have a fair understanding as to some conditions which maintain in the soils of this section. First of all, it has a grand subsoil for the retaining of moisture. It is a clay of a peculiar texture which is capable of retaining a large amount of water, without at the same time having the adverse conditions which are found in the too compact blue clays or other impervious clays. This subsoil is the redeeming feature in this section, particularly in times of drouth. Wherever we find a subsoil of sand or gravel we find a soil which will fail the tiller in drouthy times. Judging from thirty years of experience in this section, we estimate that about one-half of our seasons may be called drouthy ones, and during those seasons in particular we must depend very largely upon the subsoil water for the growing of our crops. There are times even during a plentiful rainfall, such as the one through which we have just passed, namely, the summer of 1900, when during the very important growing season of the month of June we must then get the water from the subsoil that the growing crop demands. From what we have now seen of this section, we observe that the moisture which falls in summer by rain and in winter and spring by thawing snows is stored up in the subsoil, and if we handle the soil aright we shall see to it that we make all the conditions necessary to use it rather than to let it escape through the influence of the hot suns and the south and southwest winds.

Another factor in the surface soil is that it is inclined to become loose under most of the conditions of cultivation, and when it is in that condition it very readily parts with the moisture and allows it to rapidly escape from the subsoil that we have referred to.

Facts in the newer agriculture for this section.—First, we have learned the value of a compact soil that enables it by capillary action to bring water from beneath to sustain the growing crop. In other words, the successful farmer of that section will check against a loss in his crop by ever keeping in mind a density of soil so that he can be assured that his crop can fall back upon subsoil mois-

ture in case the rains shall fail him. For this reason we have learned in the matter of plowing to do our deep plowing in the early part of the season, so as to give the soil a chance to retain its original density. If we plow late in the fall (unless it be for corn), then we plow more shallow, so as not to make too loose a soil for the crop of the following summer.

For this reason largely we have found by experience that one of the best conditions for a grain crop is to keep the corn field clean —which has already become compact by natural settlement and increased by the packing of the tools, teams and men in its cultivation—and discing the same to the depth of about two or three inches. By this method it is readily seen that we have this compact soil that we have referred to.

The second fact is that we know to a certainty the great value that there is in some form of mulch for the surface soil, that shall check evaporation. In some cases, as in the growing of trees, we can use the mulch of straw, hay and other refuse. In place of this we use the earth mulch, or what is sometimes called the dust blanket, which is nothing more nor less than keeping the surface soil loosened by continuous cultivation, which destroys the capillary action of the denser soil and prevents the escape of water, because it cannot ascend through this loosened condition of soil.

What the Campbell packer proposes to do.—With the understanding now of our conditions of soil and also a clear view of these two facts, which will ever maintain in our best agriculture, we can readily see what Mr. Campbell proposed to do with what is termed his subsoil packer.

First of all, he proposes to restore the density of the soil artificially by putting upon the newly plowed land when it is freshly turned his packer, which is a roller composed of wheels, each wheel having a wedge face, and the wheels closely placed upon an axle, and all put within a frame very like the wooden roller, and the whole weighted down by rocks, which are placed in the box so as to give it a proper weight. We here call attention to what we believe to be sometimes a serious defect on the part of the operator in using a Campbell packer. If one shall fail to do the rolling while the soil is in a moist condition then the work is very inefficiently done and, we consider, would not be worth the time consumed in passing the roller over the soil. On the other hand, if the packer is used while the soil is moist, immediately after the plowing, it will settle that soil back to a high degree of density, packing it not upon the surface alone, indeed leaving that in somewhat of a loose condition, but packing it quite firmly from the bottom of the furrow

to within about one inch of the top of the soil. We have taken a spade after the packer has been used and cut down through the soil to the bottom of the furrow and have found the soil to be in what we have called a firmly packed condition.

Where the Campbell packer may fail in giving good results.—In case the growing season is reasonably moist, by reason of showers at proper times, then it is evident that the work of the packer would not be very valuable, as there would be but little need for the plant to call upon the reservoir of moisture in the subsoil, and, consequently, this dense condition that would be favorable to capillary action would not be needed. Here is where we think the Campbell packer has been discounted as to its value, because the test was made in a season where this condition existed.

The Campbell packer aids in late plowing.—In case a farmer has a piece of land that ought to be plowed deeper than he has plowed it, and his work has been such that he could not do it in the early part of the season, then by the aid of the Campbell packer he can plow deeper in the late fall and restore the dense condition that we have referred to as being so desirable by this artificial method. In other words he can make the packer do what time and gravity would have done, provided he had plowed in August.

Another help can be gained from the packer in that we can have a larger opportunity for breaking up the soil at a depth that is desirable when it becomes too hard. There is no question but what the continued plowing of the land at a certain depth tends by reason of the pressure of the plow and the tramping of the teams to make a density at the bottom of the furrow which is more than is to be desired and very naturally checks the downward growth of many of the roots of our crops. If one shall attempt to break this by very deep plowing, regardless of time or the aid of this packer, he is very apt to create a condition of looseness of the soil that will seriously injure his crop for the next season, provided it is a drouthy one. By means of the packer this danger can be avoided, for regardless of time he may plow as deep as he wishes and then restore the desirable condition of density at once by means of this implement.

One word of caution.—There might be a time when the soil would be so moist that we should not use this packer, as it would almost tend to puddle the land. This, however, is a condition of things which rarely ever maintains in the section of the state that we refer to. We should, however, keep this matter in mind in the using of the packer, so that while we would want a moist condition

at the time of its use, we would see to it that it was not what would be called wet when we passed this roller over the soil.

Surface cultivate when the Campbell packer is used.—Those who are familiar with the writings of Mr. Campbell recall the fact that he lays great stress upon the cultivation of all crops. He goes so far as to advocate even the cultivation of the small grains. We had upon our place one of his grain cultivators. He proposed to drill in the small grain, either wheat or oats, upon this compact soil, so made by his packer, and then to cultivate between the drill rows. Now, we think that this is too costly a method to pursue in connection with small grain growing on these western prairies. We have, however, very successfully used a slanting tooth drag upon the growing grain in a dry season and in that way in a rapid manner made the condition of mulch that he was seeking for. The method which he advocates ever recognizes one principle which we must keep in mind in the use of this packer when it is made valuable for a dry season, and that is, while the method of packing restores density to the soil and in that way provides for good capillary action by which the subsoil water will ascend to the surface of the soil in times of drouth, there must also be the dust blanket which shall prevent the wasting of the water after it has so ascended. In other words, we can sum up the condition by stating that he proposes by means of his packer and cultivator to provide for the ascent of the water and then as strictly provide against its wasting. In all our experience with the packer, and in all that we may do in future, we shall ever keep in mind these two principles whenever we expect to get any good results from what is called the Campbell System of Cultivation.

THE SAN JOSE SCALE IN PENNSYLVANIA.

Extracts from an Act Passed in that State and Approved June 10, 1901.

Section 2. It shall be the duty of the Secretary of Agriculture to cause an examination to be made, at least once each year, of each and every nursery or other place in this state where trees, shrubs, vines or plants, commonly known as nursery stock, are grown for sale, for the purpose of ascertaining whether the trees, shrubs, vines or plants, therein kept or propagated for sale, are infested with San Jose Scale or other insect pest destructive of such trees, shrubs, vines or plants. If, after such examination, it is found that the said trees, shrubs, vines or other plants, so examined, are free in all respects from any such dangerously injurious insect pest or pests, the said secretary, or his duly authorized agent or other person designated

to make such examination, shall thereupon issue to the owner or proprietor of the said stock, thus examined, a certificate setting forth the fact of the examination and that the stock so examined is apparently free from any and all such destructive insect pest or pests.

Section 3. Should any nurseryman, agent, dealer or broker send out or deliver, within the state, trees, vines, shrubs, plants, buds, or cuttings, commonly known as nursery stock, and which are subject to the attacks of the insects designated in this act, unless he has in his possession a copy of said certificate, dated within the year thereof, or wrongfully be in possession of said certificate, he shall be guilty of a misdemeanor, and upon conviction shall be punished in accordance with the provisions of section eight of this act.

Section 4. All nursery stock, as designated in this act, sent out by any nurseryman, agent, dealer or broker within this state, shall be accompanied by a copy of said certificate attached to each box, bale or package. A certificate issued by an official of the United States, setting forth the fact that the nursery stock is free from any and all such destructive insect pest or pests, shall be accepted in lieu of state inspection. Also, empowering all transportation companies to reject all nursery stock not accompanied with a certificate of inspection.

Section 5. Whenever any trees, shrubs, plants or vines are shipped into the state from some other state, country or province, every package thereof shall be plainly labeled on the outside with the name of the consignor, the name of the consignee, and a certificate showing that the contents have been inspected by a state or government officer, and that the trees, vines, shrubs or plants therein contained appear free from all dangerously destructive insects.

Section 7. When the Secretary of Agriculture, or the person or persons appointed by him, shall finally determine, in accordance with the provisions of this act, that any tree or trees, shrubs, vines or other plants, must be treated or destroyed, he shall notify in writing the owner or the person in charge of said infested stock or property, and shall direct him, within a time and in a manner prescribed in such notice, to treat or destroy such infested property. If the person so notified shall refuse or neglect to treat, destroy or disinfect said property, in the manner and within the time prescribed in the said notice, the secretary shall cause such property to be so treated, and he may employ all necessary assistants for that purpose; and such person or persons, agent or agents, employe or employes, may enter any or all premises in any township, borough or city, necessary for the purpose of such treatment, removal or destruction, and he shall certify to the owner or person in charge of the premises the

amount of the cost of said treatment, removal or destruction, and if not paid to him within sixty days thereafter, the same may be recovered together with the cost of action.

Section 8. Any person violating the provisions of this act or offering any hindrance to the carrying out of this act, shall be adjudged guilty of a misdemeanor, and, upon conviction before a magistrate or justice of the peace, shall be fined not less than ten dollars and not more than one hundred dollars for each and every offense, together with all the costs of the prosecution, and shall stand committed until the same is paid.

SMALL FRUITS IN NORTHEASTERN MINNESOTA.

H. H. CHAPMAN, SUPT. SUB-EXPERIMENT STATION, GRAND RAPIDS.

There is practically no prairie in northeastern Minnesota. Every farm becomes such only by dint of such labor as our forefathers underwent in New England and Ohio. But the soil resembles much more closely New England than Ohio conditions, there being but little of the clay and black loam soils peculiar to the latter state, which made the labor of clearing yield such rich returns.

Ours is a frontier section and like all such has its proportion of shiftless as well as industrious settlers. The growing of small fruits on a large scale for market will be limited for some time to come, first, by the fact that so little of the soil is subdued to any kind of agriculture; second, by the indisposition of settlers to diversify or specialize while the main struggle for a livelihood is pressing them so hard; third, by the distance from market and poor roads, which handicap many of them.

Here and there, where local conditions are favorable for growing and marketing, men are found specializing in strawberries and other fruits, with good results. When strawberries are grown commercially this far north, they have the decided advantage of a late market. At Grand Rapids the crop ripens between the 4th and 18th of July.

Wild fruit is very abundant, especially raspberries and strawberries. The blueberry crop is more uncertain, but in favorable years there is never more than a small fraction of the crop gathered for market—the labor involved being greater than the returns. High bush cranberries are abundant in favorable seasons.

These native fruits supply the settler's table for the trouble of picking them, and delay the advent of the day when the cultivated varieties will take their place. In the main, small fruits are now grown in northeastern Minnesota, in a small way, as the set-

tlers find time to set out a few strawberries or raspberries, for the sake of their superior size and quality. It will only be a question of time when northeastern Minnesota will be known as a good fruit growing section. The comparative certainty of a heavy snowfall, and the protection from sweeping winds furnished by the timber, which insures a more even distribution of the snow over the surface, extends the range of hardy varieties much further north than would be the case in a prairie section. A somewhat heavier and better distributed summer rainfall, due to the vicinity of Lake Superior and, possibly, in part to the timber, is another encouraging factor. Locally, such large bodies of water as Mille Lacs, Leech Lake and others, modify climatic extremes and make conditions very favorable for fruit growing. Such conditions are well illustrated on the west shore of Rainy Lake, where a Duchess apple tree has borne fruit for six consecutive seasons. The region about Mille Lacs has already a reputation for its fruit.

The experiment station at Grand Rapids is well to the north of the bulk of settlement and not particularly favored by natural features. It is therefore well suited to the work of testing varieties for hardiness. The limitations of the means and working force of the station have prevented us from engaging extensively in the testing of new varieties, and it was thought better to thoroughly test a few of the standard sorts for their adaptability to this region and extend the work as opportunity offered. In strawberries, the Crescent, Warfield, Haverland and Bederwood have given us good crops and proved perfectly hardy. The Splendid, Lovett, Ruby, Muskingum, Bissell and others give good promise but have not as yet had a fair trial. It has at least been shown that strawberries can be successfully grown in this soil and climate. The residents of Grand Rapids and vicinity have previously not had great success, the trouble being due probably to lack of proper mulching during the bearing season and failure to properly mix the staminate and pistillate varieties in planting.

Of the red raspberries tried, the Turner has stood the best, with Marlboro a close second. Columbian was more or less injured by winter-killing, and Logan did not prove hardy. The black caps have stood well but were more severely injured last winter than the reds. Older has proved hardiest, and Nemaha a little less so, while the Ohio appears to be unable to hold its own. The Snyder blackberry has borne fairly well and is hardy, and Ancient Briton, while later, seems to be hardy and bears well.

SUN-SCALDED SOFT MAPLE.

The soft maple, in common with many other of our native trees, is occasionally severely injured by sunscald. These trees are especially susceptible to it when they are first set out, or when set back by any adverse conditions, and for this reason the trunks of such

A sun-scalded soft maple.

trees should be protected, at least until the trees are well established. The best treatment for wounds of this kind is to cut away the dead bark and then smear the wound with soft clay, grafting wax or white lead, and wrap with a piece of old sacking or similar material. When thus treated, they heal up quickly, while if neglected the injuries may become permanent.

S. B. GREEN.

ORIGINATING NEW VARIETIES OF SMALL FRUITS.

J. C. KRAMER, LA CRESCENT.

I will endeavor to write my past experience in regard to how to obtain new varieties of small fruit.

1st. Save the seed from hardy trees, bushes, shrubs or plants of healthy growth.

2nd. Select the very best and prime berries of the kind you wish to plant.

3rd. Keep the seed of each tree or vine separate, and when you plant the seeds plant each kind from each plant separate, or you will make a mistake. Place labels on each row so you will know just where you are at and where you will be later on.

4th. Next as to the place where to raise or germinate the seeds. Take a box about two feet long, one foot wide and five or six inches deep. Fill this box with rich earth, pulverizing it fine, and press it solid. Mark it off in slight drills two or three inches apart. Now put in your seed, covering lightly with earth. Next take dry moss, rubbing it fine and making a light covering over the whole box. Do this in October or November. Then place the box in the cellar and keep moist (not wet) until March. Then bring it to light and warmth and water regularly, when they soon come up. The raspberry is slow to come up.

5th. Now is the time to keep careful watch that you have each kind separate. Now experiment and select the weak ones from the strong ones. It is no wonder that so many apple trees die young in the orchards. I generally examine my young trees or plants the first summer every day to see how they are acting. The shape of the tree, the bark and the leaf all show whether it is a good one or not. Pull up the poor trees and throw them away or, better still, burn them. They are useless and cause two or three months of trouble for nothing.

Examine your work closely, and you will find your way through to success. Never think it an easy matter, as I call it good luck if I get one out of fifty that is a good plant. I keep right on and plant seeds every year in hopes of getting good results.

In spring when danger of frosts has passed, then set the young seedlings in a good locality in well manured ground, about one foot apart and see what they will do. Some of them will bring fruit in eighteen months from the seed, others will go for two years and, again, to three years.

RAISING PLANTS OF THE RASPBERRY AND BLACKBERRY.

A M. SHEPHERD, MINNEAPOLIS.

We secure almost our entire output of these plants from suckers. Our practice is to set a new plantation every spring for growing plants only, and to secure plants from this plantation in the fall of the second and third years only (preferably the second), digging the plants in the fall and heeling in for use the following spring. Plants taken from the plats after the third year from setting propagate less freely and are weaker each succeeding year as the plantation grows older.

Early in the spring of the second year (and third, if plants are used) we cultivate deeply to break the roots, causing them to sucker much more freely. After this early cultivation they are left entirely to themselves until the plants are dug. The main thing in securing sucker plants that will make a strong growth is to dig properly. Don't push the spade in once beside the plant and then pull and pry it out! Such plants have no parent or lead root, it being broken off by this improper mode of digging, and the plant is not worth setting as a gift. Take your spade (we assume that it is always sharp) and cut off the lead root, not closer than two inches from the plant on both sides, viz.: toward the parent plant and in a parallel line on opposite side of the sucker. Then insert the spade near the plant between these two cuts and dig out the plant—not pull it out. These plants have the parent root as in root cuttings, and with us give results fully equal to them and at a minimum expenditure of labor.

New varieties are obtained from seed saved as soon as the fruit is ripe and planted in the open ground if the soil is in prime condition, or stratified until the following spring if not. Root cuttings are made in the fall from roots from one-fourth to one-half an inch in diameter, and cut in pieces from one to four inches long (preferably long) according to scarcity of the variety propagated. These may be buried in boxes of sand or stored in a cool cellar till spring. They callous more rapidly in a cool cellar. They are planted in April or May in the open ground. The pieces are planted horizontally, about two inches deep, in rich, mellow soil. Bottom heat may be used and stronger growth of cane secured the first season, as they are thus started from one to two months earlier in the frames. At current prices of plants, however, this is impracticable except in case of scarce or new varieties. Where bottom heat is used shorter and slender roots may be used, which would not do where planted in the open ground.

Black raspberries are multiplied by layerage. The extreme tips are secured by covering the current season's growth with a light covering of earth, and a strong plant is formed thereby for next season's planting. Some propagators wait until the new wood is partially matured before tipping. We tip as soon as possible after the old canes are through fruiting. In our experience, the sooner tipped the stronger the new plant. Black caps may also be propagated by root cutting, though it is very seldom resorted to.

BLACKBERRY CULTURE.

ROLLA STUBBS, BEDERWOOD.

For blackberries I prefer clay soil, as it holds the moisture much better than black loam. After putting my ground in good condition for planting I take a single shovel plow and run furrows eight feet apart. Then I take good thrifty plants and plant in the furrows four feet apart in the row. When through planting I cultivate between the rows to fill up the furrows. The first season I raise potatoes between the rows set. I hoe and cultivate blackberry plants every season and do not mulch with hay or straw. I prefer keeping the ground clean and a dust mulch. Plow two or three times a week with cultivator.

My experience has been mostly with the Synder. I think they are most prolific in bearing and surer of a crop than Ancient Briton or Stone's Hardy. With me the canes do not grow large or stiff, which makes them easier to lay down in the fall. In this respect I prefer the Synder, and they are not much harder to handle than raspberries except for the thorns. In putting them down I use the same method as in raspberries.

I do not pinch or trim the vines off in spring, but I go through and trim off the new wood that comes out in the way of picking the fruit. Early in the spring I cut off the tops of canes that are to bear fruit, leaving canes three and one-half to four feet high. Pruned in this way, they send out branches producing a heavy crop of fruit. The last two years I have received $2.00 per case for 24 quarts each throughout the season, making $200 per acre some seasons. Some of my neighbors have tried raising blackberries on marsh lands, but it has not proved a success. One great objection is that the stalks grow too large and are then too brittle to lay down. I do not wire them upon a trellis, as the vines hold the fruit up good in clay ground. Those vines that are eighteen inches to two feet above ground and where the fruit is shaded, I find bear the largest and sweetest berries.

GROWING HALF-HARDY FRUITS.

J. R. CUMMINS, WASHBURN.

Under conditions prevailing in this state, we cannot clearly decide what is hardy and what is not. With a range of temperature of 90° to 100° above to 20° and 50° below zero every year, long periods of drought, a dry atmosphere and high winds, sudden changes of temperature in the winter and quite often poor cultivation, we cannot say that any fruit trees or plants are perfectly hardy in the northwest. Of the apple, very few varieties are perfectly hardy. The Yellow Sweet seems to be more so than even the Hibernal. While the Duchess may be generally hardy, it is not in all locations. Without any doubt many of the new seedlings, hybrids and apples originating in the state will endure the climatic changes better than those we have been growing. The successful growing of some varieties of apples from the south, for some years, has been very encouraging. Many varieties supposed to be tender have come through in good shape. Among these is the Jonathan, though some injured in the winter of 1898 and '99—Feb. 9th, 20° to 40° below, and for fourteen days previous to Feb. 12, below zero—not at all injured last winter—20° below. This year the tree has made a good growth. Scotts Winter, Iowa Blush, Red Warrior, Mann and others came through the last winter in good condition.

The growing of some varieties of the pear is promising. The Russian varieties seem to be perfectly hardy, not injured any in 1898 or '99. The Flemish Beauty, Seckel and Wilder were injured on the limbs and top but the body was not. Bessemianka proved hardy. Kiefer, some protected, not injured—came through last winter not protected, and fruited this summer. Flemish Beauty fruited this summer, not protected last winter. All dwarf pears (on quince roots) were entirely killed last winter, owing to the roots being hurt, as were also several hundred grafted two-year apple and hybrid trees.

The quince may be grown but will need protection, particularly the roots, in a winter of not much snow. There is not much encouragement in growing the peach; even if good protection has brought the tree through, unfavorable weather will destroy the bloom in the spring.

While the native plum tree is perfectly hardy grafted on roots of the wild, there is a failure quite often of the fruit, from unfavorable weather at blooming. The crop of plums this year (1900) was the largest, perhaps, ever grown in the state. The conditions prevailing in the spring were very favorable for the first setting. Cheney,

one of the Japans, Col. Wilder, Aitkin and some others blooming April 27th, April 29th, 54° to 80° and 54° to 70°, to May 2d, when there was frost and mercury at 30°. Also frost May 4th. For some reason the early blooming plums were not hurt. After this the weather continued dry and warm and so favorable that the Miner fruited heartily.

Seedlings of the Miner plum gave good yields last year. The earliest, the Milton, was ripe July 20, Col. Wilder a few days later and the Duchess first part of October. The Domestica is not sure to produce fruit, the Russian also doubtful. While the Japans originating in this country endure the climate much better than varieties from Japan, they are not to be depended on. Red June and Simonii fruited this last summer. Abundance, near Carver, top-worked, also bore. Many varieties of grapes were badly injured last winter though well covered.

Several varieties of the cherry seem to be hardy.

TREATMENT OF THE STRAWBERRY FIELD AFTER PLOWING AND BEFORE RE-SETTING.

JOHN EKLOF, STOCKHOLM.

There are various methods of treating an old strawberry bed to get the soil in good condition for resetting it to strawberries, which requires not less than two years. When the strawberry bed becomes unprofitable it is plowed up, as soon as the crop is harvested. The straw is not burnt off unless it is so heavy as to hinder plowing. We usually mulch two-year-old beds also. The land is again plowed in the fall and seeded to wheat or oats the following spring. After the grain is harvested we apply manure at the rate of fifty loads to the acre. The land is then plowed immediately after the manure is spread. The next year corn is planted, without plowing. We go over twice with the cultivator and finish with the harrow. The ground is then in good condition for a crop of corn. In the fall when the corn is cleared off the ground, which we do as early as possible, we again plow, this time quite deep.

During winter we haul about eight loads of soft wood ashes to the acre, which is put all in one pile on this land, and covered with hay to keep from leaching. Only soft wood ashes are obtainable here, but any amount of it can be had at two neighboring creameries and one flouring mill. The object of hauling the ashes in winter, is because time is too valuable in spring when the ashes

are to be used. The ashes are easily distributed over the field with one horse and a road scraper and afterwards spread with a shovel.

In the spring before planting time, the ashes are spread and the land gone over with the riding cultivator until it is perfectly free from weeds.

Of course the corn stubble is now on the surface, and must be removed, but it takes one man with a hand rake only half a day to clear one acre. After this is done, the land should be gone over once with the harrow. The land is then ready for marking and resetting of the strawberry field.

THE GREENWOOD CRAB AND OTHER TREES.

E. H. S. DARTT, OWATONNA.

In a letter from Geo. A. Tracy, of Watertown, S. D., who has had much experience in fruit growing, he says: "Of the trees I bought of you in 1882 and '83, but few are alive. Of fifteen Greenwood crab planted, ten are alive. Of ten Milton crab, four are alive. Of five Briars Sweet, three are alive. Of fifty Duchess planted, two are alive. Tetofsky are all dead. Wealthy all died in two or three years. Dartt's Hybrid (now Dartt), bore a few crops and then blighted to death. Early Strawberry bore splendidly a few years and then died. Two Minnesota were killed by rabbits. Orange crab did well five or six years, then died. Hyslop and Lake Winter never amounted to much; all dead. Haas and Maiden's Blush died first winter. The Johnson plum (now Owatonna), I got of you, lived and bore lots of plums. Trees died mostly from root-freezing and drouth, a few from rabbits and mice. Have you the Greenwood now? They are the most profitable tree that has yet borne apples for me."

I have had the Greenwood crab about thirty years. In tree it nears perfection. It is a No. 1 stock on which to graft other varieties. It is a very early and abundant bearer. Fruit medium size and quality good. It should be on our recommended list for northern Minnesota. It ripens with the Duchess and is not of great value where the Duchess is successfully grown. However, it may be well to have a few trees to bear in off years. One season ten Greenwoods produced more bushels than 2,500 other trees in the same orchard of an average older growth. It came originally from Ingraham Gould, a pioneer nurseryman of Beaver Dam, Wis.

GRAPES ADAPTED TO MINNESOTA.

GUST JOHNSON, EXCELSIOR.

If the question before this society was what kind of grapes can be raised in Minnesota, I would say we can raise any kind of grapes from Champion up to Catawba and get them ripe in most years, but when we come to talk about kinds adapted to this state, the list has to be cut down a great deal. The reason many kinds grow here and still are not adapted, is from causes not sufficiently understood. Some of these causes are mildew, tenderness from early and late frosts and root-killing. One of the greatest causes I have found in my experiments, is over-bearing. They seem to get along all right until the time of ripening, when they stop while they are green or half ripe, even if the weather is warm and favorable for ripening.

As an example I would name Rog. 15, Agawam. I should hate to have to give up raising it, because it bears heavily, is a good keeper and seller. If we get a cold night or two early in September, it won't go ahead and ripen like the Concord, for instance, which seems to get increased energy to ripen from the same cause. On the other hand we find varieties of entirely northern blood, as Concord and its progeny of pure and hybrid seedlings, showing better adaptability to this state. In order I would first name the Concord. Even if it is late on account of a heavy crop, it don't show the disposition of not ripening its fruit like some of the hybrids, but if overloaded it will rid itself of part of the crop by rot and ripen its fruit with its wood. The next in order would be its seedling Worden, which is earlier but will have to have better care than its parent. Still earlier is the Moore's Early, which I like. Of the finer quality of grapes we can't very well omit the Delaware, which has probably done more than any other variety to bring Minnetonka grapes into popular favor, and the Brighton, which is one of our finest hybrids but is more subject to root-killing than the others named. If one likes to try the Rogers hybrids, the No. 9 generally ripens but don't set perfect bunches every year.

Before I end this paper I want to speak a good word for two more kinds that are not much spoken of here. The first is the Wyoming Red, which ripens early, mostly ripe and gone before the Delaware. It is a healthy and heavy bearer, but ripens its crop well. And Pocklington, a Concord seedling, which bears a heavy crop every year. It is rather late, a few days after Concord but will ripen about as well as the Concord and if not ripe will bring more for jelly than Concord ripe will. These two have done well with me for a series of years, and I would recommend them for trial.

THE COMPASS CHERRY.

O. W. MOORE, SPRING VALLEY.

(Read before the So. Minn. Hort. Society.)

I find that the Compass Cherry is comparatively a new fruit and is but little known in the southern part of the state. It is a hybrid of the sand cherry and the Miner plum. Its habit of growth is of the medium between the upright and spreading form, and it is perfectly hardy in every respect. Those that I have have had no root protection whatever and have withstood the winters of 1897-8 and 1898-9 without injury. They bore fruit the past season, being the second year after planting, and the quantity of fruit was surprising for trees of their age. For home use and canning purposes they fill a long felt want in the cherry line. It is true that they are not the real cherry, but, in my estimation, they are the next best fruit pertaining to the cherry yet found. In my opinion they are not a fruit that will bear shipping, as their skin is very thin and easily broken, and the fruit perishable. The tree has a habit of making wood very rapidly after the fruit is gathered and in time also for it to get well ripened before cold weather. It is the only fruit with me thus far that some bug or insect is not lying in want to get in its work on as soon as opportunity offers.. It is not troubled by the curculio or the birds or anything else unless it might be that ever prevailing danger, the boys. As to its drouth resisting qualifications, there is no doubt as to their effectiveness. During the severe drouth of about three months in the fore part of the past summer my Compass Cherry trees stood the ordeal in a remarkable manner. Their staunch, sprightly vigor in leaf, wood and fruit told a tale of drouth resisting power that must be seen to be appreciated.

The Orchard Map.—Labels fade out, and if attached by string are often lost, while wire fastenings work into the wood. A convenient plan is to make out a rough map of the orchard with good paper and ink, showing location of all varieties, with age, date of planting, name of nursery and other useful notes. If such a map is kept with the same care as other valuable papers, it will prove a good help.

Purchase trees from a home nursery, as you are most likely to secure varieties that will succeed in your locality, and for the further reason that if anything is not satisfactory the matter can be more readily adjusted than where the nursery is several hundred miles away.

"I am using bushel crates to store apples for winter keeping. They are made with solid ends and bottoms and slatted sides. For ends I use ¾ in. boards, and for bottoms ¼ in. stuff made at a basket factory near by. The slats are 2 in. wide. The crates are 13 in. wide, 12 in. deep and 18 in. long and will hold a plump bushel of apples when level full. This allows of one crate being set on top of another when filled with fruit without bruising the contents."—S. W. B.

Secretary's Corner.

COME TO THE STATE FAIR.—If for no other reason, come to see the new Agricultural Building where horticulture is making a regal spread.

A LIGHT APPLE CROP.—Too much fruit last year and very dry conditions this season are making the apple crop of 1901 a very light one. There are, however, exceptional orchards that are bearing well from local rains or from light bearing last year. Can't you arrange to give your thirsty trees a good drink another year when the weather is hot and dry and so keep the fruit on the trees as well as give it size?

THE CHIEF OF THE DIVISION OF FORESTRY—Mr. Gifford Pinchot, the present occupant of this office visited the northwest in the interest of the work intrusted to his charge the last week in July, and the writer had an opportunity to shake hands with him Friday of that week. He had much to say of the practical work in the way of protection of the forests and reforestation now under way and is full of faith in the largeness of results.

THE SAN JOSE SCALE IN PENNSYLVANIA.—A law has just been passed by the legislature of Pennsylvania, becoming operative August 1st, requiring among the other usual regulations in similar laws directed against this pernicious insect that all nursery stock coming into the state shall be accompanied by a certificate from the proper officer stating its freedom therefrom. A large proportion of the northern states now have such inspection laws in force.

IS YOUR APPLE CROP A GOOD ONE?—A correspondent says: "I picked off lots of apples last year and am getting my pay this year." That tells the whole story. Did you thin your trees last year, when apples were fifty cents a bushel and so get a good crop this year, when they are worth three times as much?—and some have sold in this market at wholesale as high as $1.85 per bushel. Next year will be a big apple year in all probability, and of course you will then thin out your over-bearing Wealthy trees and get your pay the next year.

MINNESOTA FRUIT AT THE PAN-AMERICAN EXPOSITION.—With the limited means at their disposal the Minnesota Commissioners are trying to make a creditable showing of fall fruits at the Buffalo Exposition, and some fruit has already been engaged for this purpose. Perhaps the reader may have an opportunity in a practical way to assist in this effort. The very light apple crop this year makes the undertaking an especially difficult one, as we can readily judge from our experience in connection with a similar exhibit at our state fair.

A MONUMENT FOR THE ORIGINAL WEALTHY APPLE TREE.—"In my immediate vicinity (five miles away) more than one hundred years ago, was discovered the Baldwin apple. Quite recently a granite monument, ten feet high, has been erected by the Woburn Historical Society near the site of the original tree. This monument has a record inscribed on it, and on the top of the granite pillar an apple as large as a peck measure is carved. I suggest the locality where the Wealthy apple was grown be marked with a substantial stone monument, to which I will contribute $5.00 when it is completed.

"About 1790, Colonel Loammi Baldwin, of Woburn, Mass., an eminent civil engineer, while surveying a route for the Middlesex Canal (the first canal in America), came to a native apple tree on the Butters' farm, in Wilmington, Mass., the fruit of which he believed in. After grafting it into his orchard he was free to give the fruit and scions to his many acquaintances. Baldwin's name for his favorite apple was "Pecker," after the marks on the bark of the tree made by the woodpecker.

"Colonel Baldwin was one of the founders of the Middlesex Agricultural Society in 1795, the first of its kind in America. The apple became so generally appreciated in Baldwin's day, that at a business meeting of the society, when he was present, a vote was taken, that with his consent the apple should be renamed the "Baldwin."

"It is well to designate in enduring granite the locality where such superb fruits as the Baldwin and Wealthy apples were born, sacred spots or Meccas where interested pilgrims may visit and see where good fruits began.

"I have guided many persons to the "Butters' Row" in Wilmington, Mass., on the Butters' farm, where the Baldwin apple came up, at least one hundred and fifty years ago.

"The Wealthy apple is a part of the life work of Peter M. Gideon, produced by him from a seed in far away Minnesota—and may it remain a blessing for one hundred years or more!

"About 1863 John Butters, who was then eighty-three years old, told me that he ate apples that had fallen from the original tree, for it was on his grandmother's farm. He said, 'they were fine to eat in the fall.' So it may be said that I am a sort of connecting link with the Baldwin apple, by way of conversation with live men, having talked with John Butters, who ate fruit from the original tree of one of America's most noted apples, not less than one hundred and fifteen years ago.

"These two benefactors, Baldwin and Gideon, lived long enough to see that the world was better for their living in it, by their efforts in apple culture. Their example is worthy of imitation by a host of followers."

JACOB W. MANNING.

Reading, Mass., August 15, 1901.

THE MINNESOTA HORTICULTURIST.

VOL. 29. OCTOBER, 1901. No. 10.

HORTICULTURE AT THE 1901 MINNESOTA STATE FAIR.

A. W. LATHAM, ASST. SUPT. HORT. DEPT.

The Minnesota State Fair, closing Sept. 7, stands easily at the head of the long line of successful fairs that have been held under the management of the Minnesota State Agricultural Society. In this success the horticultural department claims its full share. Many things contributed to make the 1901 exhibit of fruits and flowers especially complete and attractive. First in the list stands the occupation of the new structure bearing on its front the title, "Agriculture," and on its north end the title, "Horticulture." The horticultural exhibit occupied in the north end of this new building a space eighty feet in depth by the full width of the building, 160 feet. This area is of about the same length and a few feet wider than the old horticultural hall, the additional width being taken up in increasing the width of the aisle spaces. The tables used were the same in number and practically the same in width as in the old hall, though averaging a little longer. These more spacious aisles, as well as the wide open space, some thirty-two feet, opposite the north entrance, added greatly to the attractiveness of the display as well as to the comfort of the multitudes of visitors.

The arrangement of the space devoted to horticulture was very much the same as heretofore, the body of the hall being occupied by the tables referred to on which the fruit was displayed, while the florists' exhibits were arranged along the wall spaces. The World's Fair Booth, which has been such a conspicuous object in the horticultural hall since 1893, was transferred to the new hall and placed at the north end of it. Evergreen decorations were displayed on the walls between and over the windows, and on the posts supporting the interior of the structure, and festoons of evergreen rope were suspended between this department and that occupied by agriculture.

No general description of the hall would be complete without referring to the unique and most attractive exhibit of the Jewell Nursery Company. This consisted of a turret, about nine feet high and eighteen feet in diameter, mounting four guns, all, both turret and guns, being veneered with apples, and resting on a pyramid of shelves some six feet from the floor. The shelves were filled with plates of fruit. This exhibit was thought to be of so much value as an exponent of Minnesota horticulture by the Minnesota Board of Commissioners for the Pan-American Exposition that they arranged to have it transferred to the exposition at Buffalo, where as this goes to press the turret is doubtless revolving, telling its tale of the beauties of Minnesota fruit.

Other nursery displays were made by the Minnetonka Nursery and W. L. Taylor, of Howard Lake.

Notwithstanding the scarcity of fruit in Minnesota this year that shown was of even a higher quality than that shown the year before, although in numbers of plates it may have fallen off a little. The fruit was not more highly colored, but of larger size, and especially in plums it was an extraordinary display. Grapes were also much better than in the previous year. The mushroom exhibit was, as usual, a very attractive feature of the hall, though it was not as large as in some other years. This was not the fault of the exhibitors, however, but was owing to climatic conditions peculiarly unfavorable to the development of the mushroom.

There were shown altogether 3,348 plates of fruit, made up as follows: apples, 2,364 plates; plums, 515 plates; grapes, 454 plates; and a number of plates of peaches and pears. Premiums were offered in this department as follows: Apples, $501.25; grapes, $151.00; plums, $136.25; sundries, $16.25; total for fruit, $704.75. Flowers for professionals, $309.50; for amateurs, $52.50; total for flowers, $362.00. Mushrooms, $40.00.

The published list of the names of the varieties of fruits shown at this fair, following this report, will be found of great interest to those who are keeping posted as to the development of pomology in our state. The total number of varieties in the various classes will doubtless be a surprise to the readers, as it was to the compilers. The details of the work and results in this department are better set forth in this list and in the list of awards, also printed herewith, than they can be in any other way, and to these the reader who is interested to pursue the subject further is referred.

Many well known horticulturists of the northwest were present at the fair, among whom were Professors N. E. Hansen, of Brookings, S. D., and C. B. Waldron, of Fargo, N. D., horticulturists of

the experiment stations of their respective states. Most of the older exhibitors were in attendance as usual. The absence of the late J. S. Harris was especially noted, as he has ever since the organization of the society been such a conspicuous figure at the state fair. His counsel and ready help were sorely missed. The exhibit from his old experiment orchard was arranged by his son, Frank I. Harris, who was in attendance. Wm. Somerville, of Viola, was also unable to be present. His place was filled by his son, L. E. Somerville. There are many new exhibitors coming into this department to take the places of those whose absence we lament, thus assuring its continued growth and interest.

Experience, reinforced by consultation with exhibitors in this department, suggests the advisability of a number of changes in the premium list, the principal of which consists, first, of merging the professional and amateur classes into one, the distinction between the being found strictly arbitrary; and, second, the offering of premiums on all collections in a lump sum to be divided pro rata among all exhibitors, thus insuring recognition and compensation for each. The lists of varieties on which premiums are offered also need rearranging, and other minor changes could be made, it is believed, with advantage.

VARIETIES OF FRUIT EXHIBITED AT THE MINNESOTA STATE FAIR, 1901.

The following list contains the names of apples and plums shown at the Minnesota State Fair, in Sept, 1901, and the num- of plates of each kind. The correctness of the spelling of some of these names can not be vouched for, as they are not to be found in any published list accessible to the proof reader. The list includes a few numbered seedlings.

APPLES.

	No. of Plates.
Aneroson	1
Anderson, P. D.	1
Anisovka	7
Arabian	2
Arcade Beauty	2
Avista	3
Arcade Round	1
Arthur	2
Anis, Striped	8
Anisim	35
Antonovka	28
Alegar	1
Arkansas Black	1
Alice	2
Arcade	4
Alexander	2
Autumn Streaked	4
Arctic	1
American Codling	1
Aport	2
Blue Anis	2
Boiken	1
Ben Davis	16
Ben Davis Sweet	2
Ben Davis Seedling	1
Brett	21
Brett No. 1	2
Brett No. 2	4
Brett No. 3	2
Breskovka	1
Bode	12
Browny	3
Borovinca	11
Bogdanoff	3
Borsdorff	11
Bates' Winter	1
Babbitt	1
Bailey Sweet	1
Bourbon Queen	1
Chenango Strawberry	2
Czar's Thorn	1
Cross	11
Cross No. 413	2
Christmas	7

	No. of Plates.
Charlamoff	24
Culver's Green	2
Cotterell's No. 1	1
Cotterell's No. 2	1
Cotterell's No. 3	1
Cotterell's No. 4	1
Cotterell's No. 5	2
Cotterell's No. 6	1
Cinnamon	1
Charlotten	1
Crampton	4
Clark's Orange	2
Clara	1
Day's No. 1	1
Day's No. 2	1
Day's No. 3	1
Day's Seedling	1
Duchess No. 4	3
Duchess No. 6	3
Duchess No. 7	1
Duchess No. 8	4
Duchess of Oldenburg	122
Dabold	1
Drake	1
Dartt	1
Douglas No. 3	1
Douglas No. 4	1
Excelsior	5
Euranda	1
Early Champion	2
Eucrasco	2
Estaline	3
Elgin Beauty	2
Fossberg	5
Fameuse	16
Giant Swaar	1
Grey Seedling	3
Grimes' Golden	1
Golden Russet	7
Glass Green	2
Grandfather	1
Getman	2
Golden Pearl	1
Green's Winter	1
Golden White	2
Gideon No. 1	2
Gideon Seedling	1
Gilbert	5
Green's Sweeting	1
Grundy	8
Grundy White	1
Gideon	5
Golden Pippin	1
Green's Shylonka	1
Hindusin's Streaked	2
Howard No. 2	2
Hybrid Russet	1
Hibernal	45
Hibernal No. 378	1
Haas	35
Harding	5
Hotchkiss	4
Humphrey	1
Iowa Beauty	3
Ivory White	1
Jonathan	1
Judson	11
Jungfrau	1
Jefferies	2
James' Sweet	2
Kniss, P. J.	1
Kaump	8
Klukosko	1
Kavelos	2
Krimskoe	2
Lydiard's No. 2	1
Lord's L	2
Lord's Sweet	2
Lyman's No. 1	1
Lubsk Queen	5
Lowland Raspberry	6
Little Hat	5
Longfield	34
Lead Apple	1

	No. of Plates.
Lead (3m)	2
Lou	3
Little Roman Stem	1
Lydia	2
Large Long White	1
Loudon Seedling	1
Moscow	1
Mass. Red	1
Milton	1
Maple	5
Malinda	28
Melon	8
Melvin	1
McMahon White	34
Mill's	1
Milwaukee	1
Mann	1
New Yorker	3
Noel	4
Newell's Winter	3
Northern Spy	4
Northwestern Greening	37
North Star	2
Overflowing	1
Ole K. No. 3	3
Ohligee, No. 3	1
Obart	2
Okabena	96
Ostrokoff (4m)	18
Ostrokoff Glass	2
Oxford's Winter	1
Oxford's Orange	1
Okeroe	1
October	9
Plumb's Cider	5
Perry Russet	3
Patten's Greening	43
Peerless	69
Paul	2
Prolific Sweet	2
Pewaukee	4
Peterhoff	1
Pickett's No. 5	1
Pickett's Prolific	1
Patten's No. 104	1
Patten's No. 105	1
Peter	17
Phoebe	6
Price's Sweet	1
Peach	6
Queen Muscatine	1
Oblings No. 14	1
Omenesk	2
Rollin's Russet	2
Rollin's Pippin	4
Rollin's Prolific	7
Red Queen	6
Roland Beauty	1
Red Repka	3
Red Pipka	3
Red Cheek	2
Resonant	1
Russian Gravenstein	2
Red Duck	4
Red Astrachan	5
Redpath's Seedling	1
Repka Malenka	12
Roxbury Russet	2
Russet's No. 1	1
Rose Queen	2
Romeo	1
Rosy Aport	1
Russian Green	3
Red Anis	1
Russian C	21
Russian H	3
Russian R	11
Russian W	5
Russian Y	7
Russian 4	2
Russian 9	1
Russian 15	1
Russian 23	1
Russian 43	1

	No. of Plates.
Russian 62	1
Russian 214	2
Russian 236	1
Russian 238	1
Russian 277	1
Russian 413	1
Russian 900	1
Russian 1260	2
Romanka	11
Reinette Koursk	2
Romanisk	4
Switzer	4
Sarinka	1
Spiced Aromatic	1
Safstaholm	1
Schmidt's Seedling	1
St. Peter Russet	1
Soiree	2
Sivar	1
Smith's Seedling No. 2	1
Saxton	3
Sandy Glass	10
Scout's German	3
St. Lawrence	9
Shackleford	1
Swanley White	14
Sweet Pipka	1
Sheepnose	2
Skylonka, Green's	2
Thompson's Seedling	21
Thompson's No. 3	1
Thompson's No. 5	3
Thompson's No. 6	2
Thompson's No. 7	1
Thompson's No. 13	3
Thompson's No. 18	2
Thompson's No. 24	5
Thompson's No. 25	1
Thompson's No. 33	3
Thompson's No. 34	3
Thompson's No. 37	4
Thompson's No. 38	5
Thompson's No. 39	2
Thompson's No. 51	3
Thompson's No. 52	3
Thompson's No. 54	1
Thompson's No. 55	4
Thompson's No. 70	2
Thompson's No. 71	1
Talman Sweet	5
Titus	3
Tetofsky	17
Thaler	2
Utter	10
University	9
Volga Craft	1
Volga Cross	1
Vargulek	1
Vulcan	1
Voganoff	1
Victor	1
Veronish Red	2
Viola	3
White Russet	1
Wolf River	19
White Pippin	2
Wabasha	2
White Arctic	1
Windsor	1
Warder's Golden Sweet	1
White Pigeon	15
Wealthy	189
Waif	1
William's	1
Walbridge	15
Yellow Sweet	17
Yellow Transparent	26
Zotonoff	1
Zukoff's Winter	5

CRABS AND HYBRIDS.

Alaska	5
Abigail	1
Beecher's Sweet	2
Brier Sweet	21
Cotterell	1
Conical	1
Dartt	2
Early Strawberry	27
Faribault	2
Florence	19
Gideon No. 6	9
Greenwood	5
Golden Beauty	3
Gen'l Grant	7
Gibb	5
Hyslop	23
Hesper Blush	1
Lyman's Prolific	9
Lydiard No. 1	1
Lydiard No. 2	2
Martha	34
Minnesota	17
Meader's Fall	2
North Star	1
Orange	8
Orion	1
October	9
Powers	4
Pride of Minneapolis	17
Quaker Beauty	2
Red Lake Winter	1
Red Cone	4
Sweet Russet	8
Soulard	1
Shield's	1
Transcendent	23
Tonka	40
Virginia	34
Voronitsh Red	1
Whitney	29
Wealthy	8

The following is the list of varieties exhibited and number of plates of each variety in the ten entries for best ten apples:

Duchess	7
Peerless	6
Charlamoff	5
Hibernal	5
Okabena	5
Patten's Greening	5
Anasim	3
Antonovka	3
Brett	2
Haas	2
Malinda	2
McMahon White	2
Ostrokoff	2
Peter	2
Wolf River	2
Anis	1
Bode	1
Gideon	1
Giant Swaar	1
Kavelos	1
Longfield	1
Mills	1
Northwestern Greening	1
North Star (Patten's)	1
Peach	1
Prolific Sweet	1
Queen Beauty	1
Rosy Aport	1
Reinette Koursk	1
Russian 214	1
Thompson's No. 24	1
Thompson's No. 38	1
Utter	1
Vorontsh Red	1
Total	80

PLUMS, NATIVE.

	No. Plates.
Aitkin	10
American Eagle	4
Beatty	1
Blackhawk	4
Bixby	1
Brittlewood, No. 1	1
Brittlewood, No. 2	3
Bradshaw	1
Bursota	1
Bryan, W. J.	1
California Seedling	2
Chas. Downing	1
Cheney	20
Choice Seedlings	5
City	2
Cook's Choice	1
Clement's Seedling	1
Comfort	2
Cotterell	2
Compass Plum	4
De Soto	22
Diana	1
Dresbach	1
Emily	2
Esther	1
Etta	1
Eureka	5
Forest Garden	22
Forest Rose	1
Gaylord	1
Girard's Early	5
Golden Queen	1
Hammer	2
Hoag	1
Heaton	1
Hart's De Soto	1
Harrison's Peach	3
Hawkeye	12
Hein's Seedling	1
Hunt	1
Hybrid Sand Cherries	2
Iowa Beauty	1
Kennedy	1
Kreuger	1
Kerkhoven	1
Le Duc	1
Leudloff's Yellow	1
Louise	3
Lemke's Yellow Seedling	1
Lillie	1
Marcus	1
Mankato	2
Marcellus	1
Meyer	1
Miller	1
Mollie	1
Moon	2
Miner	1
Muncy	1
Moreman	1
Nebraska	1
Niel's Peach	2
North Star (Penning)	2
New Ulm	11
Ocheeda	7
Odegaard	1
Paul Wolf	2
Parker (W. L.)	3
Peach (Gideon's)	1
Penning's Seedling No. 3	1
Redpath Seedling (from Aitkin)	1
Reed	1
Rollingstone	11
Rockford	12
Silas Wilson	1
Smith's Red	1
Stellar's No. 3	1
St. Paul	1
Stoddard	12
Surprise	12
Van Buren	1
Weaver	15
Wilder	1
Wood	1
Wood's Seedling No. 1	2
Wood's Seedling No. 9	1
Wolf (Cling)	19
Wolf (Free Stone)	2
Wittman No. 2	3
Wittman No. 2	3
Wyant	14

DOMESTICA AND JAPANESE

Abundance	3
Burbank	4
Burbank's Japanese	1
Burbank's America	1
Burbank's Seedling	1
Blue Damson	2
Damson Swedish	1
Domestica Seedling	1
Domestica Seedling (O. M. Lord)	1
Green Gage Seedling	1
Marianna	1
Moore's Arctic	1
Knudson's Japanese	1
Japanese De Soto	2
Minnesota Prune	1
Purple Seedling	1
Prune Seedlings (Wilfert)	2
Russian	1
Shipper's Pride	2
Shropshire Damson	1
Wild Goose	1

PREMIUMS AWARDED ON FRUITS AND FLOWERS AT MNNESOTA STATE FAIR IN 1901.

(Under the Auspices of the Minnesota State Horticultural Society.)

Superintendent—J. M. Underwood, Lake City.

Asst. Superintendent—A. W. Latham, 207 Kasota Blk., Minneapolis, Minn.

APPLES.—(Open to All.)

Sweepstakes Collection.

	1st. Prem.	2nd Prem.	3rd Prem.
L. E. Somerville, Viola, Minn.	$25.00		
W. L. Parker, Farmington, Minn.		$15.00	
Rolla Stubbs, Bederwood, Minn.			$10.00
Peck of Wealthy Apples—			
A. D. Leach, Excelsior, Minn.	5.00		
J. A. Howard, Hammond, Minn.		3.00	
A. A. Bost, Excelsior, Minn.			2.00

Collection of ten varieties of apples to be judged with special reference to the size, beauty and perfection of the fruit (crabs and hybrids excepted), $25.00. To be divided pro rata among all the exhibitors in this lot.

W. L. Parker, Farmington, Minn., $4.05; A. B. Coleman, Long Lake, Minn., $3.45; Thos. Talbert, Wayzata, Minn., $2.85; P. H. Perry, Excelsior, Minn., $2.25; Ditus Day, Farmington, Minn., $3.05; Nils Anderson, Lake City, Minn., $3.25; H. H. Heins, Lydia, Minn., $3.65; F. J. Peterson, Waconia, Minn., $2.45.

(For Professionals.)

Collection (hybrids and crabs excepted)—

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
L. E. Somerville, Viola, Minn.	$25.00				
J. A. Howard, Hammond, Minn.		$20.00			
F. J. Peterson, Waconia, Minn.			$15.00		
W. L. Parker, Farmington, Minn.				$10.00	
F. I. Harris, La Crescent, Minn.					$5.00

Collection of hybrids and crabs, not to exceed 10 varieties—

	1st Prem.	2nd. Prem.
W. L. Parker, Farmington, Minn.	$5.00	
F. I. Harris, La Crescent, Minn.		$4.00

SINGLE PLATES.

	1st Prem.	2nd Prem.	3rd Prem.
Minnetonka Nursery Company, Eureka, Minn.	$1.00		
F. I. Harris, LaCrescent, Minn.		$.75	
F. J. Peterson, Waconia, Minn.			$.50
Anisim—			
W. L. Parker, Farmington	1.00		
L. E. Somerville, Viola		.75	
F. I. Harris, LaCrescent			.50
Long Arcade—			
W. L. Parker, Farmington	1.00		
F. I. Harris, La Crescent		.75	
Blushed Calville—			
L. E. Somerville, Viola	1.00		
F. J. Peterson, Waconia		.75	
Brett—			
W. L. Parker, Farmington	1.00		
F. I. Harris, LaCrescent		.75	
Ben Davis—			
J. A. Howard, Hammond	1.00		
Minnetonka Nursery Company		.75	
L. E. Somerville, Viola			.50
Charlamoff, Peterson's—			
W. L. Parker, Farmington	1.00		
F. J. Peterson, Waconia		.75	
J. A. Howard, Hammond			.50
Christmas—			
F. J. Peterson, Waconia	1.00		
Cross—			
W. L. Parker, Farmington	1.00		
L. E. Somerville, Viola		.75	
Fameuse—			
O. M. Lord, Minnesota City	1.00		
L. E. Somerville, Viola		.75	
Gilbert—			
L. E. Somerville, Viola	1.00		
Grundy—			
L. E. Somerville, Viola	1.00		
R. H. L. Jewett, Faribault		.75	
Harding—			
J. A. Howard, Hammond	1.00		
L. E. Somerville, Viola		.75	
Humbolt—			
L. E. Somerville, Viola	1.00		
Haas—			
W. L. Parker, Farmington	1.00		
L. E. Somerville, Viola		.75	
Thos. Redpath, Wayzata			.50
Judson—			
J. A. Howard, Hammond	1.00		
W. L. Parker, Farmington		.75	
Kaump—			
J. A. Howard, Hammond	1.00		
O. F. Brand & Son, Faribault		.75	
Longfield—			
J. A. Howard, Hammond	1.00		
L. E. Somerville, Viola		.75	
W. L. Parker, Farmington			.50
Lubsk Queen—			
L. E. Somerville, Viola	1.00		
Lowland Raspberry—			
L. E. Somerville, Viola	1.00		
F. I. Harris, LaCrescent		.75	
Maple—			
L. E. Somerville, Viola	1.00		

	1st Prem.	2nd Prem.	3rd Prem.
MacMahon White—			
W. L. Parker, Farmington	1.00		
L. E. Somerville, Viola		.75	
J. A. Howard, Hammond			.50
Malinda—			
J. A. Howard, Hammond	1.00		
W. L. Parker, Farmington		.75	
Thos. Redpath, Wayzata			.50
Northwestern Greening—			
O. M. Lord, Minnesota City	1.00		
J. A. Howard, Hammond		.75	
L. E. Somerville, Viola, Minn.			.50
Ostrokoff (true))—			
F. I. Harris, LaCrescent	1.00		
Peerless—			
W. L. Parker, Farmington	1,00		
Minnetonka Nursery Company, Eureka		.75	
F. J. Peterson, Waconia			.50
Phebe—			
L. E. Somerville, Viola	1.00		
Peter—			
J. A. Howard, Hammond	1.00		
L. W. Pettijohn, Minnetonka		.75	
Thos. Redpath, Wayzata			.50
Repka Malenka—			
W. L. Parker, Farmington	1.00		
L. E. Somerville, Viola		.75	
Rollin's Prolific—			
J. A. Howard, Hammond	1.00		
L. E. Somerville, Viola		.75	
Sandy Glass—			
L. E. Somerville, Viola	1.00		
Minnetonka Nursery Company, Eureka		.75	
Talman Sweet—			
O. F. Brand & Son, Faribault	1.00		
L. E. Somerville, Viola		.75	
F. I. Harris, La Crescent			.50
Tetofsky—			
J. A. Howard, Hammond	1.00		
L. E. Somerville, Viola		.75	
W. L. Parker, Farmington			.50
Utter—			
J. A. Howard, Hammond	1.00		
Walbridge—			
W. L. Parker, Farmington	1.00		
O. M. Lord, Minnesota City		.75	
Wolf River—			
L. E. Somerville, Viola	1.00		
J. A. Howard, Hammond		.75	
White Pigeon—			
L. E. Somerville, Viola	1.00		
F. J. Peterson, Waconia		.75	
Yellow Sweet—			
F. J. Peterson, Waconia	1.00		
L. E. Somerville, Viola		.75	
Yellow Transparent—			
W. L. Parker, Farmington	1.00		
L. E. Somerville, Viola		.75	

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
Duchess of Oldenburg—						
J. A. Howard	$1.75					
G. F. Stellar, Excelsior		$1.50				
Thos. Redpath, Wayzata	..		$1.25			
L. E. Somerville, Viola				$1.00		
R. H. L. Jewett, Faribault					$.75	
Rolla Stubbs, Bederwood						$.50
Hibernal—						
Minnetonka Nurs'y Co., Eureka	1.75					
W. L. Parker, Farmington		1.50				
G. F. Stellar, Excelsior			1.25			
R. H. L. Jewett, Faribault				1.00		
W. L. Taylor, Howard Lake					.75	
Thos. Redpath, Wayzata						.50
Okabena—						
J. A. Howard, Hammond	1.75					
W. L. Parker, Farmington		1.50				
Thos. Redpath, Wayzata			1.25			
F. I. Harris, La Crescent				1.00		
L. E. Somerville, Viola					.75	
Patten's Greening—						
R. H. L. Jewett, Faribault	1.75					
W. L. Parker, Farmington		1.50				

	1st Prem.	2nd Prem.	3rd Prem.	3th Prem.	5th Prem.	6th Prem.
J. A. Howard, Hammond			1.25			
Minnetonka Nurs'y Co., Eureka				1.00		
L. E. Somerville, Viola					.75	
F. J. Peterson, Waconia						.50
Wealthy—						
Seth H. Kenny, Morristown	1.75					
Rolla Stubbs, Bederwood		1.50				
J. A. Howard, Hammond			1.25			
R. H. L. Jewett, Faribault				1.00		
F. J. Peterson, Waconia					.75	
Thos. Redpath, Wayzata						.50

SAMUEL B. GREEN, Judge.

(For Amateurs.)

Collection (Hybrids and Crabs excepted)—

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
H. H. Heins, Lydia	$15.00				
Wm. Oxford, Freeburg		$10.00			
Ditus Day, Farmington			$8.00		
A. D. Leach, Excelsior				$4.00	
J. L. Cummins, Washburn					$2.00
Collection of hybrids and crabs, not to exceed ten varieties—					
H. H. Heins, Lydia	5.00				
A. B. Coleman, Long Lake		4.00			
F. J. Butterfield, Long Lake			3.00		
Ditus Day, Farmington				2.00	
Henry Dunsmore, Olivia					1.00

SINGLE PLATES.

	1st Prem.	2nd Prem.	3rd Prem.
Antinovka—			
H. M. Lyman, Excelsior	$1.00		
P. H. Perry, Excelsior		.75	
H. H. Heins, Lydia			.50
Anisim—			
H. F. Busse, Station A, Minneapolis	1.00		
H. M. Lyman, Excelsior		.75	
Wm. Oxford, Freeburg			.50
Brett—			
A. B. Coleman, Long Lake	1.00		
W. S. Widmoyer, Dresbach		.75	
H. M. Lyman, Excelsior			.50
Ben Davis—			
A. M. Mitchell, Hammond	1.00		
A. D. Leach, Excelsior		.75	
Wm. Oxford, Freeburg			.50
Charlamoff, Peterson's—			
A. W. Keays, Elk River	1.00		
Thos. Talbert, Wayzata		.75	
Ditus Day, Farmington			.50
Christmas—			
H. M. Lyman, Excelsior	1.00		
Fameuse—			
A. A. Day, Farmington	1.00		
D. F. Akin, Farmington		.75	
Ditus Day, Farmington			.50
Grundy—			
H. H. Heins, Lydia	1.00		
Haas—			
A. D. Leach, Excelsior	1.00		
H. H. Heins, Lydia		.75	
A. M. Mitchell, Hammond			.50
Kaump—			
H. M. Lyman, Excelsior	1.00		
A. M. Mitchell, Hammond		.75	
W. S. Widmoyer, Dresbach			.50
Longfield—			
A. M. Mitchell, Hammond	1.00		
A. D. Leach, Excelsior		.75	
P. H. Perry, Excelsior			.50
Lubsk Queen—			
H. M. Lyman, Excelsior	1.00		
Lowland Raspberry—			
H. M. Lyman, Excelsior	1.00		
Ditus Day, Farmington		.75	
Maple—			
H. H. Heins, Lydia	1.00		
MacMahon White—			
A. M. Mitchell, Hammond	1.00		
Thos. Talbert, Wayzata		.75	

	1st Prem.	2nd Prem.	3rd Prem.
Wm. Oxford, Freeburg			.50
Malinda—			
Ditus Day, Farmington	1.00		
A. B. Coleman, Long Lake		.75	
S. O. Miller, Eidswold			.50
Northwestern Greening—			
Wm. Oxford, Freeburg	1.00		
A. M. Mitchell, Hammond		.75	
H. H. Heins, Lydia			.50
Peerless—			
H. H. Heins, Lydia	1.00		
A. D. Leach, Excelsior		.75	
Mrs. S. R. Spates, Markville			.50
Phebe—			
H. H. Heins, Lydia	1.00		
Peter—			
A. B. Coleman, Long Lake	1.00		
A. D. Leach, Excelsior		.75	
P. H. Perry, Excelsior			.50
Rollin's Prolific—			
A. M. Mitchell, Hammond	1.00		
Talman Sweet—			
Ditus Day, Farmington	1.00		
Tetofsky—			
A. A. Day, Farmington, Minn.	1.00		
Nils Anderson, Lake City		.75	
Utter—			
H. M. Lyman, Excelsior	1.00		
Nils Anderson, Lake City		.75	
A. M. Mitchell, Hammond			.50
Walbridge—			
Nils Anderson, Lake City	1.00		
F. J. Butterfield, Long Lake		.75	
Wm. Oxford, Freeburg			.50
Wolf River—			
A. M. Mitchell, Hammond	1.00		
Wm. Oxford, Freeburg		.75	
Yellow Sweet —			
H. M. Lyman, Excelsior	1.00		
A. A. Day, Farmington		.75	
J. R. Cummins, Washburn			.50
Yellow Transparent—			
H. M. Lyman, Excelsior	1.00		
F. J. Butterfield, Long Lake		.75	
J. R. Cummins, Washburn			.50

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.	6th Prem.
Duchess of Oldenburg—						
A. M. Mitchell, Hammond	$1.75					
J. M. Walden, Northfield		$1.50				
F. J. Butterfield, Long Lake			$1.25			
H. H. Heins, Lydia				$1.00		
P. H. Perry, Excelsior					$.75	
A. D. Leach, Excelsior						$.50
Hibernal—						
A. D. Leach, Excelsior	1.75					
H. M. Lyman, Excelsior		1.50				
Thos. Talbert, Wayzata			1.25			
H. H. Heins, Lydia				1.00		
F. J. Butterfield, Long Lake					.75	
A. M. Mitchell, Hammond						.50
Okabena—						
H. M. Lyman, Excelsior	1.75					
H. H. Heins, Lydia		1.50				
A. M. Mitchell, Hammond			1.25			
Nils Anderson, Lake City				1.00		
Leo Goldenstar, Garden City					.75	
Ditus Day, Farmington						.50
Patten's Greening—						
A. D. Leach, Excelsior	1.75					
Ditus Day, Farmington		1.50				
S. O. Miller, Eidswold			1.25			
A. B. Coleman, Long Lake				1.00		
A. M. Mitchell, Hammond					.75	
H. M. Lyman, Excelsior						.50
Wealthy—						
A. D. Leach, Excelsior	1.75					
A. A. Bost, Excelsior		1.50				
P. H. Perry, Excelsior			1.25			
H. M. Lyman, Excelsior				1.00		
A. M. Mitchell, Hammond					.75	
Ditus Day, Farmington						.50

W. L. PARKER, Judge.

CRABS AND HYBRIDS.
(Open to All.)

Briar's Sweet—	1st Prem.	2nd Prem.	3rd Prem.
W. L. Parker, Farmington	$1.00		
J. A. Howard, Hammond		.75	
J. M. Walden, Northfield			.50
Early Strawberry—			
Nils Anderson, Lake City	1.00		
H. H. Heins, Lydia		.75	
F. J. Butterfield, Long Lake			.50
Florence—			
H. M. Lyman, Excelsior	1.00		
Thos. Redpath, Wayzata		.75	
Thos. Talbert, Wayzata			.50
Gideon's No. 6—			
O. M. Lord, Minnesota City	1.00		
J. A. Howard, Hammond		.75	
W. L. Parker, Farmington			.50
Greenwood—			
H. M. Lyman, Excelsior	1.00		
F. J. Peterson, Waconia		.75	
D. T. Wheaton, Morris			.50
Hyslop—			
A. B. Coleman, Long Lake	1.00		
Mrs. Frances L. Town, Lakeland		.75	
A. D. Leach, Excelsior			.50
Lyman's Prolific—			
H. M. Lyman, Excelsior	1.00		
J. R. Cummins, Washburn		.75	
A. B. Coleman, Long Lake			.50
Martha—			
W. L. Parker, Farmington	1.00		
J. A. Howard, Hammond		.75	
P. H. Perry, Excelsior			.50
Pride of Minneapolis—			
Thos. Redpath, Wayzata	1.00		
F. J. Butterfield, Long Lake		.75	
Mrs. S. R. Spates, Markville			.50
Sweet Russett—			
J. A. Howard, Hammond	1.00		
A. D. Leach, Excelsior		.75	
Ditus Day, Farmington			.50
Tonka—			
F. S. Harris, LaCrescent	1.00		
Thos. Talbert, Wayzata		.75	
H. H. Heins, Lydia			.50
Transcendent—			
W. J. Tingley, Stillwater	1.00		
H. H. Heins, Lydia		.75	
J. M. Walden, Northfield			.50
Virginia—			
Minnetonka Nursery Co., Eureka	1.00		
W. S. Widmoyer, Dresbach		.75	
D. F. Akin, Farmington			.50
Whitney—			
J. A. Howard, Hammond	1.00		
W. L. Parker, Farmington		.75	
Mrs. Frances L. Town, Lakeland			.50

SEEDLING APPLES.
(Open to All.)

Collection, excluding crabs and hybrids—	1st Prem.	2nd Prem.	3rd Prem.
D. F. Akin, Farmington	$8.00		
H. M. Lyman, Excelsior		$6.00	
Ditus Day, Farmington			$4.00
Collection of crabs and hybrids—			
Ansel Gideon, Excelsior	6.00		
H. M. Lyman, Excelsior		4.00	
Ditus Day, Farmington			2.00
Fall variety, not sweet, never having received a premium at the Minnesota State Fair—			
H. M. Lyman, Excelsior	6.00		
D. F. Akin, Farmington		4.00	
H. M. Lyman, Excelsior			2.00
Winter variety, not sweet, never having received a premium at the Minnesota State Fair—			
Andrew Wilfer, Cleveland	10.00		
D. F. Akin, Farmington		8.00	
O. F. Brand & Son, Faribault			2.00
Sweet variety, never having received a premium at the Minnesota State Fair, of such excellent quality as to make it worthy of general cultivation; either fall or winter—			
J. R. Cummins, Washburn	6.00		
H. M. Lyman, Excelsior		4.00	
D. F. Akin, Farmington			2.00

SAMUEL B. GREEN, Judge.

GRAPES.

Collection—	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
Gust. Johnson, Excelsior	$20.00				
A. A. Bost, Excelsior		$15.00			
Isabella Barton, Excelsior			$10.00		
C. F. Wheeler, Excelsior				$8.00	
F. I. Harris, LaCrescent					$5.00
Agawam (Rogers No. 15)—			**1st Prem.**	**2nd Prem.**	**3rd Prem.**
G. F. Stellar, Excelsior			$1.50		
Gust. Johnson, Excelsior				$1.00	
Isabella Barton, Excelsior					$.50
Aminia (Roger's No. 39)—					
R. A. Latham, Excelsior			1.50		
Barry—					
Gust. Johnson, Excelsior			1.50		
Brighton—					
A. A. Bost, Excelsior			1.50		
F. I. Harris, LaCrescent				1.00	
R. A. Latham, Excelsior					.50
Concord—					
Gust. Johnson, Excelsior			1.50		
G. F. Stellar, Excelsior				1.00	
M. M. Frisselle, Excelsior					.50
Cottage—					
Gust. Johnson, Excelsior			1.50		
R. A. Latham, Excelsior				1.00	
Minnetonka Nursery Co., Eureka					.50
Campbell's Early—					
F. I. Harris, LaCrescent			1.50		
Delaware—					
G. F. Stellar, Excelsior			1.50		
Gust Johnson, Excelsior				1.00	
C. F. Wheeler, Excelsior					.50
Duchess—					
R. A. Latham, Excelsior			1.50		
G. F. Stellar, Excelsior				1.00	
Gust Johnson, Excelsior					.50
Early Victor—					
Isabella Barton, Excelsior			1.50		
Eldorado—					
Isabella Barton, Excelsior			1.50		
Empire State—					
A. A. Bost, Excelsior			1.50		
Isabella Barton, Excelsior				1.00	
C. F. Wheeler, Excelsior					.50
Green Mountain—					
C. F. Wheeler, Excelsior			1.50		
Herbert (Roger's No. 44)—					
R. A. Latham, Excelsior			1.50		
Gust Johnson, Excelsior				1.00	
C. F. Wheeler, Excelsior					.50
Iona—					
A. A. Bost, Excelsior			1.50		
Gust Johnson, Excelsior				1.00	
Minnetonka Nursery Co., Eureka					.50
Janesville—					
Minnetonka Nursery Co., Eureka			1.50		
A. A. Bost, Excelsior				1.00	
Lindley (Roger's No. 9)—					
Gust. Johnson, Excelsior			1.50		
M. M. Frisselle, Excelsior				1.00	
C. F. Wheeler, Excelsior					.50
Lady—					
R. A. Latham, Excelsior			1.50		
A. A. Bost, Excelsior				1.00	
C. F. Wheeler, Excelsior					.50
Martha—					
Gust. Johnson, Excelsior			1.50		
Massasoit (Roger's No. 3)—					
C. F. Wheeler, Excelsior			1.50		
J. R. Cummins, Washburn				1.00	
Minnetonka Nursery Co., Eureka					.50
Moore's Diamond—					
A. A. Bost, Excelsior			1.50		
Minnetonka Nursery Co., Eureka				1.00	
Moore's Early—					
Gust. Johnson, Excelsior			1.50		
R. A. Latham, Excelsior				1.00	
Isabella Barton, Excelsior					.50
Niagara—					
F. I. Harris, LaCrescent			1.50		

	1st Prem.	2nd Prem.	3rd Prem.
Gust Johnson, Excelsior		1.00	
Isabella Barton, Excelsior			.50
Pocklington—			
Gust. Johnson, Excelsior	1.50		
A. A. Bost, Excelsior		1.00	
Isabella Barton, Excelsior			.50
Telegraph—			
C. F. Wheeler, Excelsior	1.50		
Gust Johnson, Excelsior		1.00	
Wilder (Roger's No. 4)—			
Gust Johnson, Excelsior	1.50		
Woodruff Red—			
Gust Johnson, Excelsior	1.50		
Isabella Barton, Excelsior		1.00	
Worden—			
J. M. Walden, Northfield	1.50		
Gust Johnson, Excelsior		1.00	
J. R. Cummins, Washburn			.50
Wyoming Red—			
Gust Johnson, Excelsior	1.50		
J. R. Cummins, Washburn		1.00	
C. F. Wheeler, Excelsior			.50

R. L. MACKINTOSH, Judge.

PLUMS.

Sweepstakes Collection. Open to all competitors and subject to the foregoing rules, with the following modifications: 1st. The fruit need not have been grown by the exhibitor. 2nd. The collection may include any variety, seedling or otherwise, grown in Minnesota. 3rd. Each plate shown must be plainly labeled with the name and address of its grower. Printed cards for this purpose will be furnished on application to the superintendent.—$50.00.

O. M. Lord, Minnesota City, $15.50; W. L. Parker, Farmington, $12.00; J. R. Cummins, Washburn, $4.00; Nils Anderson, Lake City, $3.50; Martin Penning, Sleepy Eye, $5.00; Mrs. S. R. Spates, Markville, $10.00.

Collection (not to exceed 15 varieties) in uniform one pint glass jars. To be accompanied by a statement of the method used in putting them up.

	Prem. 1st.	Prem. 2nd.	Prem. 3rd.
O. M. Lord, Minnesota City	$10.00		
W. L. Parker, Farmington		$8.00	
T. S. Ellison, St. Paul			$6.00

Collection, not to exceed 15 varieties (not in glass; fruit of early ripening may be kept in cold storage).

	1st Prem.	2nd Prem.	3rd Prem.
Martin Penning, Sleepy Eye	$5.00		
W. L. Parker, Farmington		$4.00	
Jos. Wood, Windom			$3.00

	1st Prem.	2nd Prem.	3rd Prem.
Aitkin—			
Thos. Redpath, Wayzata	$1.00		
H. H. Heins, Lydia		$ .75	
H. F. Busse, Minneapolis			$ .50
Black Hawk—			
Jos. Wood, Windom	1.00		
Cheney—			
A. W. Keays, Elk River	1.00		
W. J. Tingley, Stillwater		.75	
J. R. Cummins, Washburn			.50
De Soto—			
J. M. Walden, Northfield	1.00		
O. M. Lord, Minnesota City		.75	
Joe Wood, Windom			.50
Forest Garden—			
J. A. Howard, Hammond	1.00		
Geo. W. Strand, Taylors Falls		.75	
W. L. Parker, Farmington			.50
Hawkeye—			
D. P. Delamater, Edina	1.00		
H. H. Heins, Lydia		.75	
Rolla Stubbs, Bederwood			.50
Mankato—			
J. R. Cummins, Washburn	1.00		
New Ulm—			
R. H. L. Jewett, Faribault	1.00		
Jos. Wood, Windom		.75	
O. M. Lord, Minnesota City			.50

	1st Prem.	2nd Prem.	3rd Prem.
Ocheeda—			
H. H. Heins, Lydia	1.00		
O. M. Lord, Minnesota City		.75	
Jos. Wood, Windom			.50
Rockford—			
Jos. Wood, Windom	1.00		
A. W. Keays, Elk River		.75	
W. L. Parker, Farmington			.50
Rollingstone—			
O. M. Lord, Minnesota City	1.00		
H. F. Busse, Minneapolis		.75	
W. S. Widmoyer, Diesbach			.50
Stoddard—			
Martin Penning, Sleepy Eye	1.00		
O. M. Lord, Minnesota City		.75	
W. L. Parker, Farmington			.50
Surprise—			
Martin Penning	1.00		
O. M. Lord, Minnesota City		.75	
R. H. L. Jewett, Faribault			.50
Weaver—			
W. L. Parker, Farmington	1.00		
H. F. Busse, Minneapolis		.75	
O. M. Lord, Minnesota City			.50
Wolf—			
O. M. Lord, Minnesota City	1.50		
J. M. Walden, Northfield		.75	
A. A. Bost, Excelsior			.50
Wyant—			
O. M. Lord, Minnesota City	1.00		
Martin Penning, Sleepy Eye		.75	
R. H. L. Jewett, Faribault			.50
Seedlings, to equal or excel the De Soto plum, never having received a premium at the Minnesota State Fair—			
Andrew Wilfert, Cleveland	5.00		
Andrew Wilfert, Cleveland		3.00	
Jos. Wood, Windom			2.00
Pears—			
F. I. Harris, La Crescent	2.00		
Peaches—			
Minnetonka Nursery Company, Eureka	2.00		
A. D. Leach, Excelsior		1.00	

WYMAN ELLIOT, Judge.

FLOWERS.

(For Professionals.)

PLANTS.

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
Collection of foliage and decorative plants—					
R. J. Mendenhall, Minneapolis	$35.00				
Minneapolis Floral Company		$30.00			
E. Nagel & Co., Minneapolis			$20.00		
Jacob Hartman, Minneapolis				$15.00	
John Vasatka, Minneapolis					$10.00
Collection of greenhouse plants—					
Minneapolis Floral Company, Minneapolis	20.00				
E. Nagel & Co., Minneapolis		15.00			
Jacob Hartman, Minneapolis			10.00		
R. J. Mendenhall, Minneapolis				5.00	
Collection of climbing vines—					
John Vasatka, Minneapolis	2.00				
Jacob Hartman, Minneapolis		1.00			
E. Nagel & Co., Minneapolis			.50		
Collection of five hanging baskets, one of a kind—					
Jacob Hartman, Minneapolis	4.00				
R. L. Mendenhall, Minneapolis		3.00			
E. Nagel & Co., Minneapolis			2.00		
Minneapolis Floral Company, Minneapolis				1.00	

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.	5th Prem.
Collection of coleus—					
E. Nagel & Co., Minneapolis	2.00				
John Vasatka, Minneapolis		1.00			
R. J. Mendenhall, Minneapolis			.50		
Collection of tuberous-rooted begonias—					
John Vasatka, Minneapolis	4.00				
Minneapolis Floral Company, Minneapolis		3.00			
E. Nagel & Co., Minneapolis			2.00		
Single specimen palm—					
R. J. Mendenhall, Minneapolis	4.00				
E. Nagel & Co., Minneapolis		3.00			
Jacob Hartman, Minneapolis			2.00		
Minneapolis Floral Company, Minneapolis				1.00	
Collection of geraniums in bloom—					
John Vasatka, Minneapolis	4.00				
E. Nagel & Co., Minneapolis		3.00			
Jacob Hartman, Minneapolis			2.00		
Collection of carnations in bloom—					
E. Nagel & Co., Minneapolis	3.00				
John Vasatka, Minneapolis		2.00			
Vase filled with plants—					
E. Nagel & Co., Minneapolis	4.00				
Minneapolis Floral Company, Minneapolis		3.00			
Jacob Hartman, Minneapolis			2.00		

CUT FLOWERS.

	1st. Prem.	2nd. Prem.	3rd. Prem.
Collection of Asters—			
Minneapolis Floral Company, Minneapolis	$3.00		
E. Nagel & Co., Minneapolis		$2.00	
Jacob Hartman, Minneapolis			$1.00
Collection of Carnations—			
E. Nagel & Co., Minneapolis	3.00		
John Vasatka, Minneapolis		2.00	
Collections of Roses—			
Minneapolis Floral Company, Minneapolis	3.00		
E. Nagel & Co., Minneapolis		2.00	
Collection of Petunias—			
E. Nagel & Co., Minneapolis	2.00		
Jacob Hartman, Minneapolis		1.00	

DESIGNS, BASKETS AND BOUQUETS.

	1st Prem.	2nd Prem.	3rd Prem.	4th Prem.
Mantelpiece Decoration—				
Minneapolis Floral Company, Minneapolis	$15.00			
Jacob Hartman, Minneapolis		$10.00		
E. Nagel & Co., Minneapolis			$6.00	
R. J. Mendenhall, Minneapolis				$4.00
Twelve-inch Basket of Flowers—				
Minneapolis Floral Company, Minneapolis	5.00			
E. Nagel & Co., Minneapolis		3.00		
John Vasatka, Minneapolis			2.00	
Jacob Hartman, Minneapolis				1.00
Pyramid Bouquet—				
Minneapolis Floral Company, Minneapolis	$3.00			
L. L. May & Co., St. Paul		2.00		
Jacob Hartman, Minneapolis			1.00	
E. Nagel & Co., Minneapolis				.50
Hand Bouquet, nine inches across—				
R. J. Mendenhall, Minneapolis	3.00			
Minneapolis Floral Company, Minneapolis		2.00		
L. L. May & Co., St. Paul			1.00	
E. Nagel & Co., Minneapolis				.50
Bridal Bouquet, White Flowers—				
R. J. Mendenhall, Minneapolis	3.00			
L. L. May & Co., St. Paul		2.00		
Minneapolis Floral Company, Minneapolis			1.00	
Jacob Hartman, Minneapolis				.50

PLANTS.

(For Amateurs.)

	1st Prem.	2nd Prem.	3rd Prem.
Single Sword Fern—			
Mrs. J. G. Johnston, St. Paul	$1.50		
Mrs. E. E. Webster, Minneapolis		1.00	
Single Foliage Plant—			
Mrs. E. E. Webster, Minneapolis	1.50		
Mrs. A. A. Brown, Minneapolis		1.00	
Mrs. Matt Schanno, St. Louis Park			$ .50
Single Fuchsia in Bloom—			
Mrs. E. E. Webster, Minneapolis	1.50		
Single Geranium in Bloom—			
Mrs. E. E. Webster, Minneapolis	1.50		
Mrs. A. A. Brown, Minneapolis		1.00	
R. Krause, Merriam Park			.50
Single Begonia in Bloom—			
Mrs. A. A. Brown, Minneapolis	1.50		
Mrs. E. E. Webster, Minneapolis		1.00	
Single Palm—			
Mrs. E. E. Webster, Minneapolis	1.50		

CUT FLOWERS.

	1st Prem.	2nd Prem.	3rd Prem.
Collections of Asters—			
Mrs. E. M. O'Reilly, Merriam Park	$2.00		
F. H. Gibbs, Merriam Park		$1.00	
Mrs. E. E. Webster, Minneapolis			$ .50
Collection of Coreopsis—			
Daniel Gantzer, Merriam Park	2.00		
R. Krause, Merriam Park		1.00	
Mrs. E. E. Webster, Minneapolis			.50
Collection of Dahlias—			
R. Krause, Merriam Park	2.00		
Daniel Gantzer, Merriam Park		1.00	
Collection of Everlasting Flowers—			
Daniel Gantzer, Merriam Park	2.00		
R. Krause, Merriam Park		1.00	
F. H. Gibbs, Merriam Park			.50
Collection of Nasturtiums—			
Mrs. A. A. Brown	2.00		
Mrs. Mary McGammon, St. Anthony Park		1.00	
R. Krause, Merriam Park			.50
Collection of Pansies—			
Miss E. M. O'Reilly, Merriam Park	1.50		
F. H. Gibbs, Merriam Park		1.00	
Daniel Gantzer, Merriam Park			.50
Collection of Marguerite Carnations—			
Daniel Gantzer, Merriam Park	1.50		
Mrs. E. E. Webster, Minneapolis		1.00	
Collection of Verbenas—			
Daniel Gantzer, Merriam Park	1.50		
R. Krause, Merriam Park		1.00	
Mrs. E. E. Webster, Minneapolis			.50
Collection of Zinnias—			
R. Krause, Merriam Park	1.50		
Daniel Gantzer, Merriam Park		1.00	
F. H. Gibbs, Merriam Park			.50

MUSHROOMS.

To be placed on exhibition Tuesday morning, the second day of the fair, and renewed from day to day up to and including Friday following; the exhibit will be judged daily. Premium, $40.00. To be divided pro rata among the exhibitors.

G. B. Green	$18.00
Miss Clara Geeseman	12.00
H. R. Brooke	10.00

VARIETIES OF APPLES ADAPTED TO SOUTH DAKOTA.

MRS. L. A. ALDERMAN, HURLEY, SOUTH DAKOTA.

(Paper read at Sioux Falls, Jan. 22, 1901.)

I shall speak with assurance only for the southeast part of the state, but there are a few rules that apply to all. If in ignorance of the fruits adapted to your location, invest a little time and money in studying the matter up, rather than spend many times the same sum in the costly school of experience by ordering blindly of a glib-tongued salesman. If I were planting a new orchard I should visit Prof. Hansen, at Brookings, and learn all that I could of his methods and success with different fruits and their varieties, and should rely very largely on his advice as to what to plant outside of the varieties with which I am familiar. And if I could not do this I should write for his bulletins and advice.

I deem it very important that the people who are primarily in lines of work other than fruit-raising and yet who hunger and thirst after the luxuries of the orchard and garden, should know to whom they can appeal to get them started right. To me there is something very pitiful in the little tragedies that have been enacted all over our state, especially among its first pioneers. The deprivation that they submitted to bravely to pay for nursery stock sold at the most exorbitant price, being extra choice (so said the agent; in reality Ben Davis, probably), the care with which this worthless stock was tended, and the keen disappointment when the inevitable failure followed!

It always seemed to me that the tree shark's game was an aggravated case of total depravity, akin to the looting of a savings bank. But it is not in generalities that I am expected to deal, but to glean from my experience for the benefit of this society. It will bear repeating that for general adaptability all over South Dakota the Duchess is still in the lead as a business apple, but except for commercial planting one needs only a few. Their season is short. If I could raise but this one apple alone I should plant so as to have them for cooking from July 15th, when they are perhaps one-half grown, till their season is past, and a surplus for apple butter and drying—for, remember, a dried Duchess is better than a fresh Ben Davis.

The Tetofsky is a fine harvest apple for our locality. It is somewhat subject to injury from insects and blight, but after fifteen years' trial on our grounds we, two years ago, set out a block of one hundred and fifty of them. The home orchard ought to have half a dozen of them at least. It is an early Russian apple of fine

flavor, season very short, tree dwarfish, and can be planted not more than twelve feet apart.

I should plant a few Whitneys No. 20, but this apple is not a marked success as a commercial fruit. The tree is proving short-lived on our grounds, subject to attacks of insects, very susceptible to blight in blighting years, and yet if well manured (it is a rank feeder) it will bear abundantly. I am of the opinion that it is a poor self-fertilizer, as it bears best in proximity to other sorts.

The Haas, while not of the first degree of hardiness, will repay the planter in our part of the state, although I would not recommend it for planting farther north. And the same may be said of the Wolf River. It is one of the few varieties injured on our grounds in the winter of 1898-99. Fameuse is practically a failure. Plumb's Cider came into bearing late in our orchard, but the few trees that we have of this variety are among our most profitable trees. A single tree bore fourteen bushels the past year of fine large apples.

Rawle's Jannet surprised us with a full crop of fruit on a single tree, planted by mistake in a row of Duchess. It is worth whole for orchardists in the extreme southern part of the state to plant a few of these for experiment. They are a good keeper; quality medium. Our tree stands on low but not wet ground, a point it might be important to remember. The tree is not usually a success in our latitude.

The Wealthy, of course, is the apple of all apples with us. Of this variety we have the largest number of trees of any orchard in the world. Unlike its habit in its native state we find it does not bear abundantly until it is a mature tree, and I would recommend that it be planted on ground moderately low but not wet.

A northeast slope for orcharding should always be chosen wherever possible, neither the table land nor the lowest land having proved profitable for orcharding in our experience.

It might be well to lengthen the apple season by planting a very few Walbridge trees. They are a winter apple, of poor quality, tree of the hardiness of the Haas.

The list of crabs that can be successfully grown in South Dakota is very large. The list of those that are profitable is much smaller. One should have Brier Sweet for pickling and for baking and eating in its season. The Hyslop and Transcendent, peerless for preserving, must be given up. If they only blighted to death themselves we could stand it, but as they spread death and destruction to other trees one cannot afford to plant them.

We find the Virginia crab a good crab to take the place of the Transcendent, and the tree is all that could be desired. The Minnesota crab is a success with us, but we think the quality too poor to warrant its planting. The Strawberry crab is a pleasant flavored apple, hardy here, valuable chiefly because of its earliness.

Of the newer sorts Patten's Greening, Peerless, Good Peasant, Hibernal, Longfield, Malinda, and several other most promising new sorts, we have growing, but as they have not yet fruited on our grounds I cannot speak of them as one having authority.

I should plant any of those named with confidence in their worth, being careful before ordering my trees to ascertain the perfect reliability of my nurseryman, by inquiry entirely outside of those interested in his business, remembering that no Duchess label, however securely fastened, ever yet succeeded in making a tender variety of apple a success in South Dakota.

SPRAYING FRUIT TREES.

F. W. KIMBALL, AUSTIN.

At the recent winter meeting of the Southern Minnesota Horticultural Society the discussion on spraying led to an unanimity of opinion that the best known and practical remedy was Bordeaux mixture, the proper proportions being water, 50 gallons, copper sulphate, 6 pounds, unslacked lime, 4 pounds. The finer the copper sulphate the easier it will be dissolved, and in no event should it be placed in any tin or iron vessel, as it will eat through it and destroy the vessel.

I will here insert the method of mixing recommended by the U. S. Department of Agriculture, Bulletin No. 8, which is sent free to all applicants. "In a barrel or other suitable vessel place twenty-five gallons of water; weigh out six pounds of copper sulphate, tie the same in a piece of coarse gunny sack and suspend it just beneath the surface of the water. By tying the bag to a stick laid across the top of the barrel, no further attention will be required. In another vessel slack four pounds of lime, using care in order to obtain a smooth paste, free from grit and small lumps. To obtain this, it is best to place the lime in an ordinary water pail, and add only a small quantity of water at first, say a quart or a quart and one-half. When the lime begins to crack and crumble and the water to disappear add another quart or more, exercising care that the lime at no time gets too dry. Toward the last considerable water will be required, but if added carefully and slowly a perfect paste will be obtained, provided, of course, the lime is of

good quality. When the lime is slacked, add sufficient water to the paste to bring the whole up to twenty-five gallons. When the copper sulphate is entirely dissolved and the lime is cool, pour the lime milk and the copper sulphate solution slowly together into a barrel holding fifty gallons. The milk of lime should be thoroughly stirred before pouring."

The method described insures good mixing, but to complete this work the liquid should receive a final stirring for at least three minutes with a broad wooden paddle.

Now for what is this good? It is good for leaf blight and scab on plums; for scab, bitter rot, and powdery mildew on apples; and for scab, and leaf blight and cracking on pears?

Next, how to apply. For one having a good deal of this kind of work to do it would undoubtedly be best to buy a knapsack sprayer or a good hand pump with a hose and sprayer on end, said pump being such as can be placed in a pail of this mixture and the spray thrown over the tree. Many such are advertised, but of all things do not buy a cheap one, as you will be disappointed and disgusted, and your money will be thrown away. I do not think you can get a satisfactory one short of $4 to $6. If you have but a few low trees, try a watering pot with as fine a nozzle as is possible to get, and with a good step ladder you can easily drench the tree, the only trouble being waste of material.

If using a watering pot it should be of galvanized iron, or if tin it should be painted that the copper sulphate may not eat it.

When to apply. First, just as the buds are swelling and, then, after the blossom or even during the time of blossom, but follow up once every week, at least, until four to six applications have been made. If wishing to combat the codling moth, then as soon as blossoms fall add to the solution either Paris green or London purple at the rate of four ounces to fifty gallons of water. To do this make a stiff paste by stirring in water and then add the paste by stirring the whole carefully together. Let me add, always stir your solution before taking out to spray, that in case of any settling you may get all the ingredients thoroughly mixed.

Last of all remember that half done is entire waste of time and money. The only way to make a success of it is to follow it up thoroughly.

PROTECTION FROM DROUTH AND WINTER-KILLING.

G. D. TAYLOR, FULDA.

What little I have to say on this subject will be confined to my own experience in the arid region of southwest Minnesota, believing, as I do, that small fruits on our western prairies must have more and different protection from those in timbered or sheltered parts. In the first place, I am of the opinion that drouth in our section of the state is more a cause of failure than injury from frost. I think thorough cultivation from spring to fall is the great essential to retain moisture and keep up a good growth of wood that will mature sound enough to withstand thirty or forty degrees below zero, leaving the soil with a reasonable amount of moisture, as well as the roots of the plants. Then when properly mulched they are apt to come through quite a severe winter.

Different fruits require different protection for winter. With strawberries I, at the beginning of winter, or when the ground is frozen about one inch deep, cover with a mulch of slough hay, scattering a few cornstalks over the hay.

Some varieties of red raspberries require more protection than others. I have several rows of Cuthbert which I do not protect, and others of the same variety which require protection. The difference, I presume, is owing to location and surroundings. The ones that require protection I lay down, putting soil enough on to hold them, and cover with slough grass. The Loudon I have laid down and covered with soil, although said to be as hardy as any. I thought too much of them to chance them coming through our winters unprotected, even though they were in a favorable and well sheltered place.

I have only a few Columbians, which I serve the same as the Loudon. I have not as yet found a variety of black cap that will stand our climate unprotected, even in most favorable situations. I lay all varieties of black caps down one way, covering with soil and not leaving any part of them exposed. In case the soil settles away I cover with old hay or straw. In some instances I have protected red raspberries by setting cornstalks over them, like a shock, the whole length of the row. They came through the winter very good, but it is too much work compared with laying down and covering with earth. They can, however, be used to good advantage when one gets caught and the ground freezes before you get to the work. The blackberry with me is the hardest to protect sufficiently to withstand our winters. I cover with earth the same as the black caps, and then, on an average, every other winter lose

all my plants. The dewberry is an exception. I pay very little attention to them. After covering them a year or two and without success, I tried letting them have their own way, with only a slight covering, and they came through the winter all right and gave us some very nice fruit but not enough to be very profitable.

With grapes I am not a success either manipulating the soil or covering for protection. I always lay them down and cover with soil, and while a majority would come through winter and get a fair start they would die before fall. It might have been owing to extreme drouth or the ground becoming too dry before freezing.

Southwest Minnesota is somewhat subject to drouths. With any small fruit and its protection for winter one must consider the location, the surroundings or natural protection, if any, etc. My berry nurseries and garden are located on a hill protected on all sides on the northeast and east by groves and hedges. In my opinion all berry gardens should be located in a protected or sheltered place, or at least they should be the better for it.

I do not think the question of winter-killing is near as essential as the question of irrigation, especially in southwest Minnesota. If we had the moisture in the soil to begin the winter, with the protection named I believe they would come through all right. Some seasons when my black caps come through the winter all right and set a good crop of fruit, even with continued cultivation they will dry up and become hard and not plump or well filled. Seasons like this and followed by a dry fall or with little moisture, it is hard to protect from winter-killing. While with seasons of a reasonable amount of moisture from spring to late fall, small fruits protected in this way will come through the winter in good shape.

Mr. W. L. Taylor: For several years I have raised raspberries without covering, and by simply cultivating the ground during the summer, say twice a week, I would have sufficient moisture in the soil to carry them through without covering. I have raised immense crops of berries without covering.

The President: Does this apply to all kinds of raspberries or only to one or two select kinds?

Mr. W. L. Taylor: I had about a dozen different varieties, and they all came through in good shape.

Mr. J. W. Murray: Did you ever try to cultivate very late?

Mr. W. L. Taylor: That was the idea; I found that an advantage.

The President: Another question. The vines may not have been killed, but the buds may have been so injured that a good crop would not result.

Mr. W. L. Taylor: I had a good crop.

Mr. L. R. Moyer: We have been told time and again to cease cultivation the first of August, and your advice seems rather strange.

Mr. W. L. Taylor: Late cultivation has produced the best results with me with no ill effects.

Mr. C. W. Merritt: Does the gentleman cut off the tips in the fall?

Mr. G. D. Taylor: Yes, I cut them back.

Mr. C. W. Merritt: We cut all of the red raspberries back and also the black ones; we think it gives the wood a chance to ripen up and harden.

Mr. Wyman Elliot: May I inquire what time you cut them back?

Mr. Merritt: Any time after the growing season is over, so they will not have a chance to make a second growth.

Mr. J. S. Trigg (Iowa): In some parts of Oregon where there is a hard subsoil extraordinary success has been attained by the use of dynamite, even going so far where trees have been planted on a soil of hard pan three or four feet in thickness and where trees have been planted eight or nine years. They bore a hole in a slanting direction toward the tree, getting far enough away so as not to injure the tree, and then explode a charge of dynamite with the greatest advantage to the tree.

The President: At what time in the season do they do this?

Mr. J. S. Trigg: I cannot tell you just when it is done; probably in the spring of the year. Where we have a hard pan soil in Minnesota and Iowa, for instance in the vicinity of Dubuque, they put in a charge of dynamite and explode it, and they meet with excellent results where that kind of soil exists.

A SUGGESTION IN CROSSING.

EDSON GAYLORD, NORA SPRINGS.

Would it not be a matter of sagacity and wisdom for those who are working so hard and expecting so much and yet have succeeded in securing so little to stop paying so much attention to crossing in the blossom and look to the root. From various observations taken in northern Iowa and in southern Minnesota I have been lead to believe that if we would work our reform the surest and shortest way, it might be by splitting the roots of two choice varieties and uniting them, and when they are grown into one solid root get this root to sprout. From such sprouts I am inclined to think we would be much more liable to secure kinds that might take on the

characteristics of both and stand a good chance to secure the advancement we are after. In our locality we have three trees that have come up from an old tree that killed down in 1885. The three trees have been bearing many years. Two of the trees bear perfect Plumb's Cider apples. The other bears fruit which very much resembles the other two in form and in season of keeping, but the color is a deeper red and the quality different. By many it is called better. From the two first we infer the old tree to have been a Plumb's Cider, while we are inclined to the belief that the third tree has sprouted out from the original root where the two were grown solid together, and by this we have a direct combination of two kinds which appears to be quite an improvement on the Plumb's Cider. We all well know if these sprouts come up from the root above the union they will produce the original tree, but if from below they might be almost anything else. But if the sprouts have come from the part of root where the cion and lower root have grown solidly into one root, which for common would be about two inches, would it not be quite likely a tree emanating from this solid formation would partake of the characteristics of the two varieties. This one case here is not all. My attention has been called to other very much similar cases in Minnesota. So well am I convinced that this road to success is both feasible and reasonable that I am anxious to see a branch of this line of work commenced at one or more of our experiment stations.

There is another point finely connected with the above: that the cion which forms the trunk does actually force the original root into subjection and makes the root in a few years conform to the wishes of the cion. Then is there not a show of reason to believe that a root taken from the original root of an old tree might produce a tree that might partake of both varieties?

OUR NATIONAL FLOWER.

MRS. H. F. BROWN, MINNEAPOLIS.

England has the rose, Scotland the thistle, Ireland the shamrock, France the lily, and Holland the tulip. Our land is so large, the flora so varied, that it seems better for each state to select its flower and then for the whole country to have for its emblem the maize (Indian corn). It is so entirely ours, for it was never known till America gave it to the world. In the Bible corn is spoken of, but it is a name applied to any grain. Nothing in the history of the ancients gives any evidence of maize being known. So it is purely a product of our country. Then it is so artistic; every part of it lends itself to decoration. It comes out beautifully in carving

in stone. The coloring, in oil and water colors, as we all know, at all seasons is most artistic. At the time of the building of the national capitol, through the influence of Thomas Jefferson, some of the pillars in the building were capped with designs of the maize. If we could have our states take a favorite flower and make it theirs by law, as a few have, we could have a national bouquet or wreath and then our emblem, the Indian corn. It would be worthy of our beautiful land. At one time, a friend wrote to the horticultural society of each state in regard to their state flowers. Not many had adopted one, but all answered as much interested to do so. Kansas has the sunflower, New York the rose, Minnesota has the moccasin flower, by some called "Lady's Slipper." All states have a favorite, and if interest were awakened would make it lawfully theirs. The subject of the Indian corn for a national emblem has been agitated—can not our Minnesota State Horticultural Society help the movement in some way?

EFFECTIVE IMPROVEMENTS ON THE HOME GROUNDS WITH THE SMALLEST EXPENDITURE OF MONEY.

ROY UNDERWOOD, LAKE CITY.

It is somewhat surprising to note how many homes confine their improvement, so far as decorative—yes, and even economic art is concerned, to the inside of the house. This condition is noticed not only in the town and city homes, where only a limited space is left for the yard, but is also evident in very many cases where there is practically unlimited space. There are several logical reasons to account for this. The chief one, perhaps, is, that women combine, to a greater degree than men, the qualities of taste for artistic arrangement and practical knowledge of its application; to which fact, the interior of the home, therefore, bears complete evidence. Whenever you find a woman taking an interest in the production of natural effects on the lawn and in the garden, you find at once a taste in arrangement equalling that displayed inside the domicile. Another reason for the apparent neglect of the improvement of the home grounds here in the north is the comparatively short season in which improvements in the horticultural line can be enjoyed, our winters being long and the summers short. But if this fact does have any material bearing on the question, it is because of a general lack of knowledge as to how permanent improvements may be best made.

As the thought here expressed is addressed to people living in the northern states, and in view of the fact that our winter season

is the longest period of the year, the most important thing for consideration, in the writer's estimation, is the problem of instituting all improvements with a view to making them as effective as possible when nature is taking her long rest, between the months of November and May. This is not so difficult as is sometimes imagined. The beautiful and unexcelled scenery in our native woods and hillsides, during the winter, offers one solution to the question of permanent home improvement, for even the untrained eye cannot fail to perceive the exquisite shades and contrasts between the whiteness of the snow, the blue and brown of the hills and slopes and the rich green of the native evergreens. It is said that nature furnishes the pattern for everything that is really beautiful in human existence, and the statement is probably nowhere more true than when we look abroad over the forest and valley for hints to assist us in making the home what it should be. That this can be accomplished, even in the most limited space, has been proven many times by people living in crowded city lots, and that it is worth the effort is beyond question.

A word said for the native or cone-bearing evergreens is to speak of one of the most important items in the decoration of the home grounds. To one who has made a study of varieties and their arrangement for landscape effects, the evergreen offers almost unlimited possibilities. Certain it is, that in the reproduction of natural scenery in miniature on the lawn, no more effective tree exists; and when we consider the brilliant contrasts and yet soft effects it gives against the glaring whiteness of the snow or the sombre browns of late autumn, it becomes an indispensable factor in the home. There is a delicate, downy appearance in the thickly growing needles of even our common jack pine that is not duplicated by any deciduous tree. The greatest characteristic of the evergreen is, of course, its perpetual nature. By the time the deciduous trees have lost their leaves in autumn the evergreen has also shed its old needles, and when winter has begun in earnest the boughs are covered with only the freshest and greenest of the lately grown foliage. In varieties, the pine, spruce and cedar families offer us the widest assortment for northern culture, and furnish trees adapted to all purposes: stately specimens for the lawn, thick growing species for shelter belts, combined varieties for mass or clustered effects, low growing sorts for hedges and boundary lines—all these features of a well arranged home can be constructed, not only of living material, but, through the use of these evergreens, may also be made in a manner that will give to winter a touch of warmth and beauty that will make the home attractive the year around.

By the manner in which this subject has been plunged into, it must be evident that only a brief investigation of the question is to be made. To treat it exhaustively would be to go into the details of landscape architecture to a degree that would not be necessary to the purpose of this paper. What is desired is to bring into prominence a few ways in which the horticultural art may be applied and the home grounds thereby made beautiful and truly homelike with an expenditure of money really small, if the purchasing, the planting and the culture are all done intelligently. The evergreen is here given the first place, because it is the writer's opinion that the evergreen is the most important factor in the arrangement of any grounds, public or private, in the north, where the eye must view the landscape during the entire twelve months of the year. It is not the purpose to discuss details of landscape architecture as applied to large estates or parks. Our subject here is the home ground, and we will assume that the yard is of medium size, that it is comparatively level and that the conditions are about the same as we ordinarily find in the average town or country home. What we want to do is to plant it judiciously with trees, shrubs and plants, that will, by their beauty, make the home an object of affection to all members of the family, old and young. It is a mistake to put all the money and attention inside the four walls of the living rooms in the house. So much can be done with a small amount of money in the yard that we sometimes wonder that people are so prone to ignore both the possibility of improvement and the importance of it.

Next to the evergreen, our attention is first called to the deciduous trees and shrubs and to the hardy herbaceous plants. This latter class includes an endless variety of flowering plants, which remain in the ground over winter, the roots being hardy and able to withstand our severe climate. On any grounds, they are indispensable, and, for all practical purposes, take the place of the tender annual plants, which are so much used for flower beds in city parks, but which are expensive and often impractical on the home grounds.

We then find that we have for use in the improvement of the home grounds four distinct classes of plant life, evergreens, deciduous trees, deciduous shrubs and herbaceous plants. Now, the question is, how to arrange these in a manner that will prove satisfactory after they have attained size and are too large to make a change possible. Herbaceous plants and small shrubs can, of course, be moved about with little difficulty, and are, therefore, not so important in this consideration, yet the necessity of having a well developed plan in mind, even in the arrangement of the very smallest yards, is

evident. What should be done in every case is to make a rough pencil sketch of the grounds to be planted, and, after careful consideration, in which habits, size, etc., of the varieties have been studied carefully, measurements can be made and relative positions determined, in a manner that will be the means of avoiding many mistakes. Too many people wait until some unforeseen cause urges upon them the great and immediate necessity of planting some trees, quick, before another year has escaped. Usually they arrive at this conclusion just a few days before planting time or in the midst of it. Then they rush a letter off to some nursery or call in a tree agent and place an order, not even knowing what they are going to do with the stock after they receive it. This is a mistake and a costly one. Because a yard is small is no reason why it should be carelessly planted. In fact, the smaller the area, the more urgent the importance of careful arrangement. To secure desirable effects it is not necessary to have the grounds laid out by a landscape architect, and you will never enjoy the grounds as much as if you had given the matter some study yourself. If you are in doubt about any varieties you have seen catalogued, it is not difficult to get information about them. Our horticultural society is composed of men and women who have made a long study of varieties adapted to the north, and one can easily get information from any of them. Nurserymen, also, who have had experience in propagating stock in the northwest can often give valuable ideas on this point.

Neither is it necessary that you should plant your entire grounds in one season. If you have a large yard and find that to plant the whole thing would entail more expense than you care to invest, it can readily be arranged so the planting can be divided up among several seasons. In this case, it is generally the most practicable to plant the slow growing trees first, leaving the smaller shrubs to come later. In making an estimate of your planting list, the best and quickest way to arrive at a conclusion in regard to the matter of expense is to make up your mind about how much money you can afford to invest the first season. Then begin your plan of arrangement, submitting it to the nurseryman to find out what it will cost you. You will thus be able to judge how much of it you will be able to take care of that year. In this connection, the experience of the writer has been that a sketch of the grounds to be planted sent to the nurseryman, asking for suggestions, is always productive of good results. A comparison of ideas cannot fail to bring to each of the parties interested a better understanding of the situation under discussion, and, unless one is very well decided, nothing would

be lost, and much gained, by consulting with some one who is familiar with varieties, their cost, their habits, etc.

It is not intended to define here any plan for planting trees on the home grounds. To any one who has given a little thought to the question, it must be apparent that general suggestions in the arrangement of the trees and shrubbery for this purpose would be almost impossible. General suggestions regarding the planting and care of stock are always good, but when it comes to the arrangement of ornamental stock upon the grounds, be they public or private, to lay down, or attempt to do so, any fixed rules or ideas could only lead to mistakes, for the simple reason that every yard must be treated individually, the conditions of location, climate and soil being so entirely different. For instance, two yards may be the same size and offer the same space for improvements. In one of them, it may be considered practicable to plant a hedge of arbor vitæ or barberry along the walk or roadway; but with the other, while the conditions on the surface may be apparently identical, it would not be safe to infer that the same plan for planting would be as good as some other, either in the selection of varieties or in the arrangement of the same. An important thing for our horticultural society to do is to show people how they may wisely arrange their grounds, considering the different conditions that exist in various sections of the northwest. To do this, is to go at the thing from the foundation, while to advocate different forms of arrangement of the home grounds without some definite knowledge of varieties and their peculiarities would be to build a structure without a foundation.

What we want first is to accentuate the desirability of investing some reasonable attention and money in the improvement of the home grounds. To do this, we must begin the cultivation of a more general taste for the beauties of nature and a more general love for the practical study of horticulture. Combining this with the manifest importance of making the home, in all its features, a place of attraction, we find ourselves with a good and thorough motive for drawing the interest of all members and all others interested, as much as possible, in this work. Then, the interest having been attracted, our attempt should be to direct it into proper channels and make it productive of most satisfactory and lasting results.

The foregoing remarks are applied to the home as a whole, but to leave it where it stands it might be inferred that the improvements mentioned were intended to be applied only to what we have generally come to know as the "front yard." Now, the time is passing out of existence when people are confining their improvements to the front part of either the lawn or the house. No greater mistake

could be made than to adopt a plan for the improvement of the home that does not include a generous amount of thought in the arrangement of the proverbial "back yard." Ask any good housewife what the effects of an infrequently swept kitchen floor may be on the general appearance of a house and the condition of its occupants, and you will get a reply that is just as applicable to the yard. The question now is whether we should attempt to do anything in the improvement of this area, by the planting of ornamental trees, etc. In the writer's estimation, the most ornamental, as well as economical way of arranging the space in the rear of the house, is to plant it systematically with fruit trees and bushes. We are, of course, inferring that there is sufficient space here for the growing of some garden fruits and vegetables. The average town lot usually has a more or less limited space for this purpose. If there is time and inclination on the part of the owner to have a vegetable garden, sufficient space must be left for the purpose. If there is more than enough for this, the balance of the ground should not be allowed to grow up to grass and weeds, but should either be utilized by growing some of the hardy garden fruits, or else improved by planting some ornamental stock. If the taste of the owner runs more to flowers and plants than to fruit, and flowers are to be planted, the old fashioned flower bed is a feature that can never fail to afford delight to all lovers of flowers. Beds of lilies, pinks and asters along the walks, surrounding the pump, or combined in any of the various ways that might suggest themselves in each individual case, will serve both to keep alive a spirit of cleanliness and order, and also make this part of the yard a frequent resort, where members of the family may enjoy, in seclusion, the beauty of nature's handiwork.

This leaves the subject in a practical manner. To consider the improvement of the home grounds from a theoretical or ideal standpoint is to dabble in a question which should really have serious thought. The noble work being inaugurated and accomplished by the women of this century, in their civic leagues, improvement organizations, auxiliaries and other federated bodies, has been a keynote in the beginning of a great and silent revolution, now in the incipient stage of its development. The meaning of that keynote is simply this, that the people, the masses, shall be shown the possibility of surrounding themselves and future generations with what is beautiful and healthful to body and mind, a condition, which, for so many centuries, has been limited to the favored few. They are arousing interest in the great work. Now, it is the duty of our horticultural societies to furnish the corner stone of the temple, which is knowledge of how to turn that interest into practical accomplishment.

EVERGREENS IN MOWER COUNTY.

JENS A. JENSEN, ROSE CREEK.

(Read before So. Minn. Hort. Society.)

In transplanting evergreens, the most essential part is to not let the root get dry; the roots should not even have the appearance of dryness. A tree with a poor root but which has been kept moist may grow; while a tree with good roots that has been partly dry will oftentimes fail.

The two varieties planted in this vicinity the most are Scotch pine and Norway spruce. I have trees of these varieties planted in 1892. They were from fifteen to twenty inches high when planted and are now from fifteen to twenty feet high.

The Black Hills spruce is, probably, the hardest to grow of any tree I have. It has a bluish-green foliage and is certainly a beauty. It is not quite as rapid a grower as the Norway spruce. The white pine is doing well here. The blue spruce and silver cedar are beautiful trees and are doing well.

The white spruce, balsam fir and Douglas spruce are not doing very well; whether it is the ground or the treatment that is not suitable I can't tell. As standard varieties I would recommend the Black Hills and Norway spruces, and the Scotch, white and black pines. Of the ornamental varieties, blue spruce, silver cedar, the American arbor vitæ and mountain pine will do well here.

AMERICAN POMOLOGICAL SOCIETY, BIENNIAL SESSION, 1901.

PROF. S. B. GREEN, DELEGATE.

The American Pomological Society held its regular biennial meeting at Buffalo, September 12th and 13th. There was a very large attendance of representative horticulturists from all over the United States and Canada, the experiment stations being exceptionally well represented.

This society was organized in 1848 and has become noted for the importance of its reported proceedings and its lists of fruits.

The meeting was opened by prayer, which was followed by an address of welcome by W. C. Barry, of Rochester, New York. President C. L. Watrous, of Des Moines, Iowa, gave a dignified and interesting address.

Among the papers that especially interested your delegate was that on the renovation of orchards. I was surprised to hear the horticulturist of the Canadian Experiment Station recommend the

growing of sod in the orchards of Ontario to prevent winter-killing, but when he explained that in fourteen years the orchards of that section have never suffered from drouth, the peculiarities of the case were apparent. The general concensus of opinion was in favor of clean cultivation and a dust blanket.

Professor L. H. Bailey thought that it was often necessary to renovate the individual before the orchard could be renovated. He spoke on the peculiar horticultural conditions prevailing in California. He said that commercialism increased as you go west and thought that the eastern states offered as good opportunities for successful fruit growing as California.

R. Morrill, of Michigan, referred to some horticultural sayings which had almost become proverbs, such as "Spray or surrender," "Horse leg irrigation," "Dust blanket," "Renovate the man, and the orchard will be renovated." He also said that spraying when continued would often remove many other pests than those at which it was aimed; that regular spraying with Bordeaux mixture would remove oyster shell bark louse.

Professor Webster, entomologist of the Ohio Experiment Station, gave an excellent address on spraying. He thinks that the results generally obtained by individuals are poor and that there is very little really thorough spraying. He has been making very elaborate and careful tests of mixtures of oil and water. He finds it difficult to get a machine that will give a uniform mixture. He says the safety line is between twenty-five and thirty-five per cent of crude oil. He has killed peaches with twenty-five per cent under some conditions, and has used fifty per cent crude petroleum with safety. This reminds me of our experience at the Central Experiment Station this last summer, where we used a forty per cent mixture of kerosene on our Scotch pine without injury, although it was in July, and they were growing rapidly.

Professor Alwood, of Virginia, gave an address on fermentation in fruit juices. He referred to fermentation being produced by yeast organisms and to each kind producing its peculiar affect. He said that the manufacturers of wines and the brewers took great pains to cultivate just the organism that would give them best results in their liquors. This is akin to the use of starters in the ripening of cream.

Professor Fletcher, of Ontario, gave a most excellent talk on the fertilization of flowers by bees. He said that scarlet and red do not attract bees, but the lilac blue is most attractive to insects; that the Arabs kept male flowers of the date palm over for one year to

use in the next in case there were not enough male flowers formed to produce pollen.

Professor S. A. Beach, of the Geneva, N. Y., Station, discussed the spraying of plants in bloom. In 1898 a law was passed in New York making it a misdemeanor to spray trees in bloom, but this has been rendered obsolete by the fact that it is shown that spraying when plants are in bloom thins the fruit, since the Bordeaux mixture prevents the germination of the pollen. It has been found that even in a solution containing not more than two parts Bordeaux mixture to ten thousand parts of water, apple pollen would not grow. When spraying with Bordeaux mixture is very complete and repeated so that every flower is treated as it opens, the crop will be completely destroyed.

Mr. M. B. Waite, of the Department of Agriculture, spoke especially on the distribution of plant diseases, and held that bees and wasps were the important factors in distributing the disease known as "plum rot" and also the common "fire blight" of pear and apple trees. In order to get a clear idea of the action of these insects in distributing pear blight, it will be necessary to review somewhat its life history. The spores get into the trees through the flowers, through the growing tops of the new growth and through cracks in the bark. The infection is generally through the flowers, and as a result of it we have what is known as "spur blight," which is only one form of the common "fire blight." The disease generally dies out in the tree at the end of each season, but in some cases may hold over in the thick bark and start the infection for next year. The spores of this disease are found in the exuding gum which is seen in the small postules found on the diseased wood. Pear blight sometimes will grow in the nectary of the flowers and no puncture is necessary on the part of the bees in order to carry the infected nectar from one flower to another. Mr. Waite demonstrated this by careful experiments. In one case he plucked out the glands from bees and found the germs of pear blight in them. In no case did he find that pear blight was distributed by the wind, and in no case were flowers infected which were protected by netting against insects. This would show plainly that the disease was not distributed by the wind. The virus which contains the germ is sticky and cannot blow except it be perfectly dry, and then it loses its vitality quickly. However, the helpful side of the bees in the distribution of pollen he regarded as very important, and thought that since many of our varieties of apple and pears are sterile, or partially so, to their own pollen, that bees should be looked upon as a benefit rather than as

a detriment. In some parts of California, however, where they have had much trouble from blight, some of the larger growers have reached the conclusion that they can get along best without bees in their pear orchards.

Mr. L. Woolverton, of Ontario, gave a most excellent article on the shipping of fruit, particularly upon the packing and shipping of fruits to European markets. The Canadian government is taking great interest in this matter and is encouraging growers in every way in finding a foreign outlet for the surplus fruit. The Dominion of Canada has a law against misrepresentation in fruit sold in packages. This is very stringent and prevents the export of poor fruit, which is its chief object, the aim being to establish as good a reputation for Canadian fruit as has been built up for Canadian cheese, by a similar law preventing the export of filled cheese.

Senator Dunlap, of Illinois, in speaking about the facilities for finding a market for fruit in Europe, said that he knew of peaches selling at $1.30 each in France, and that it was not an uncommon thing for extra choice apples to sell at thirty cents each. These were French fruits raised in hothouses. He thinks that the French market is one of the most promising for American fruits.

Mr. Dosch, of Oregon, told of the development of the fruit growing interest in that state. He stated that the first apple trees that were brought into that state were carried three thousand miles in boxes in wagons, and that the apples from these sold for one dollar each and when sent to San Francisco brought two dollars per pound.

A number of Wilder medals were awarded, fourteen silver and eight bronze, the Wisconsin Horticultural Society receiving one of them; they were awarded to all exhibits of considerable merit.

The meeting was held at the Epworth Hotel. It was intended to use a tent for the sessions of the convention, but owing to the bad weather this was out of the question, and the dining room was used for this purpose, so that the facilities were not of the best; there was, however, a large and representative attendance from all over the United States and Canada, which gave to the meetings special interest.

EXPERIMENT STATION IN THE FAR NORTHWEST.

PROF. S. B. GREEN, ST. ANTHONY PARK.

(Notes taken on a visit to these stations early in August, 1901.)

The Brandon Experiment Station, Brandon, Manitoba, is located on bottom land of the Assiniboine river and running back to the bluff lands above. These bottom lands evidently at one time were covered with trees. Wells at 25 feet. Spring on hill side that discharges its water through the farm. Work largely devoted to variety testing and but little attention paid to stock raising. Grounds tastefully laid out and ornamented. One of the most interesting features is the use of hedges for surrounding garden plots and for similar purposes. A portion of the grounds is devoted to sample hedges in which most of our common trees and various shrubs are grown in hedge form. Among those of special interest were Acer ginnala, which seems perfectly at home here and grows to the height of about ten feet. The Cotoneaster is hardy here and grows to the height of about six feet. The common Silver Berry is native here and has been used for ornamental planting with some success. The Siberian Artemisia, Artemisia abrotanum, is perfectly hardy here but is not regarded with favor, as it is too low and scrubby to amount to much as a hedge. The Box Elder is here used for hedge purposes with excellent results, and there are a number of enclosures surrounded with this tree trimmed to hedge form. These hedges are about seven feet thick and sixteen feet high.

Pyrus baccata is the only apple that has proved hardy here. The trees of this are probably eight years old and have borne heavily in previous years, but this year the flowers were frozen so that there is no crop. The trees are in excellent condition. Some of the hybrid grapes from Ottawa have been planted here but as yet have scarcely fruited. The driveway into the farm for perhaps a half mile is lined on each side with a row of box elder alternating with a similar row of white spruce, both of which are doing very well. This spruce came from the mountains northwest of Brandon and seems to be an exceedingly hardy form. The vegetable garden is exceedingly well looked after and presents a very pretty appearance. There is a good showing of the cold climate vegetables, and cucumbers are always raised. Tomatoes, however, often fail to mature much ripe fruit. The potatoes were exceedingly nice. Of the annual flowers there is a fine collection, and those from cold climates are doing especially well. Among those noted were Asters, Calliopsis, Portulacas, Godetias, Sweet Peas and Pansies.

The plots devoted to variety tests of grain are exceedingly interesting. They are laid out fronting upon a main drive with a la-

bel, about the size of a lath, upon which the name is printed in large letters. Much attention is given to the variety testing of grains, and it seems to be regarded as a matter of first importance. In the line of grasses the Hungarian Brome grass is especially favored and regarded as the best grass for this section. They have some trouble about getting the roots out of the land and regard it as nearly as bad a weed as Quack grass. A favorite way of treating it is to grow it in meadow until the roots become too much netted together to do well and then plow it up, roll it and allow the new crop to come on from the roots. It seeds readily and produces about eighty pounds of seed per acre. A native Quack grass, Agropyrum tenerum, is highly esteemed for dry land.

In this section it is considered the best agricultural practice to summer fallow the land every other year for the purpose of conserving the moisture. This year they have had an unusual amount of rain fall, but generally the amount is scanty, and it requires about the rain fall of two seasons to mature one crop, and summer fallowing seems to be a means of storing up moisture in the soil. Mr. Bedford says that he has had many illustrations going to prove this besides the determinations of soil moisture, which have been made from time to time by the Ottawa Station, part of which was at a depth of eight feet. Where this ditch passed through stubble land the soil was so dry even to the bottom of the ditch that it did not freeze during the winter but remained like an ash heap; where it passed through land that was summer fallowed the land was so moist that it could be rolled into lumps and it froze hard in winter.

Among the plants which have been used in the sample hedges grown here are the following:

Wild Siberian Crab, a somewhat thin hedge.
Tartarian Honeysuckle, a very ornamental hedge.
Glabrous Pea Tree (Caragana), a very medium hedge.
English Old Man (Artemesia), a fine dwarf hedge.
Buffalo Berry, a promising hedge.
Box Elder, excellent compact hedge.
Japan Rose, compact, but suckers badly.
Button Bush, not promising.
Amur Privet, a very promising hedge.
Douglas Spirea, very ornamental.
Josika's Lilac, a good ornamental hedge.
Native Hawthorn, a good hedge.
Green Ash, somewhat thin hedge.
Wild Plum, fairly good.
Asiatic Maple Acer ginnala, beautiful dwarf hedge.
Buckthorn, excellent.
Siberian Pea Tree, very pretty in spring and early summer.

Red Willow, a good looking hedge.
Arbor Vitae, too tender.
Siberian Old Man (Artemesia), a quick growing windbreak.
American Larch, very promising.
French Laurel-Leaved Willow, not promising.
Red Leaved Rose, suckers badly.
Siberian Pea Tree (Caragana), one of the best medium hedges.
Common Cotoneaster, promising.
Native White Spruce, small as yet.
Laurel-Leaved Willow, a fine hedge.
Flowering Currant, a dwarf compact hedge.
Native Maple, a useful quick growing hedge.

The Indian Head Experiment Station, Indian Head, Assiniboia, is located on the rather flat prairie that seems to be typical of a large section of country adjoining, about one mile from the railroad station. An important feature of this place is the forest garden and the use of hedges about the buildings and grounds. They are very liable to have severe winds here, which occasionally blow out the grain. They have found, from actual tests, that hedges protect to the leeward to from fifty to eighty feet for each foot in height, and that they protect well for fifty feet for each foot in height. Their best crops are raised near the hedges, since here there is much moisture owing to the snow collecting near them. The chief feature of the place is variety testing of grains, but there is a good collection of stock of various kinds. The grain plots are arranged much as at Brandon.

Here also a special feature is made of the growing of sample hedges, perhaps fifteen kinds being grown. The Siberian Artemisia (Artemisia abrotanum) is considered of some value for starting new plantations but is not regarded with much favor for permanent use. The common Wolfberry (Symhoricarpus racemosus) was here used for a low hedge in much the same way that box plant is used in the south. I was surprised to see how nicely it submitted to pruning and what a very neat hedge it made. Among the plants doing well here were the Hydrangea, Cotoneaster vulgaris, Eleagnus Angustifolia, Golden Spirea, Japanese Rose, Black Berried Elder, American Mountain Ash (fruiting), European Mountain Ash, Spirea arguta, and Spirea Van Houtii.

Currants and gooseberries do well here, the latter requiring some protection but giving good results. Red Dutch and Raby Castle are regarded as the best varieties. The soil is generally too dry for best success with raspberries. A raspberry named Dr. Reider seemed to be doing best this year.

The Manitoba wild plum is raised here in considerable quantities, some being set with the idea of getting new varieties of value,

but the fruit is small and the trees generally scrubby in appearance. The Aitkin plum is the best plum that has been tried here, it being adapted to this section on account of its extreme earliness. Pyrus baccata is doing well here and bearing lots of fruit this year. While the fruit is small, yet it is regarded as being valuable for preserving. The trees are probably ten years old. The Box Elder hedges not only protect most of the farm but form the borders of the drives, which are generally about twenty feet wide. As these are kept well pruned they form an exceedingly ornamental feature. At the entrance of some of the drives the box elder grows together over head so as to form an archway perhaps fourteen feet high. In front of the house is a very nice flower garden well laid out and cared for. The dahlias were doing especially well and all the cold climate annuals. A border of white and yellow Eschscholtzia was especially fine.

This year they have had about ten inches of rain fall, but ordinarily they do not have more than seven inches. Mr. McKay says that with five inches of rain fall he feels sure of a crop, and it is about as much as he wants. In a coolie near by, which was perhaps thirty feet below the level of the surrounding country, were growing large quantities of Saskatoon berries. This is a form of our common Juneberry but is quite a little different in form and quality of fruit and general appearance of the plant, so much so that I think it quite likely a separate species. The fruit has more rich quality to it than our Juneberry and is used in considerable quantities by the settlers. In former years it formed a very considerable portion of the diet of the Indians. They were dried and used with pemmican.

The grain crops in this vicinity are generally good this year. The farmers here are generally prosperous and spend their winters in Ottawa. Land is quite valuable, and some sections near Indian Head have sold as high as $25 per acre. The government has made an effort to introduce dairying into this section and built creameries at Indian Head and other places. At Indian Head, at one time, about 500 cows were kept, but successive good crops of wheat which have sold at high prices have eclipsed the development of this industry, so that now the creamery here is idle.

Secretary's Corner.

COTTONWOOD COUNTY FRUIT.—At the Cottonwood County Fair, Mr. Dewain Cook showed seventy kinds of apples, forty of plums and several pears. The people of that prairie region should begin to be satisfied they can grow fruit there.

MINNESOTA HORTICULTURE AT THE BUFFALO EXPOSITION.—The turret of apples exhibited by the Jewell Nursery Co. at the Minnesota State Fair has been duplicated at the Pan-American Exposition, and is flying our state banner. Mr. John Nordine, of Lake City, superintended its erection, and its subsequent care is in the hands of Mr. Thos. Redpath, of Long Lake. The turret carries forty-six bushels of apples and nearly as many are displayed on the shelves below it, making an attractive exhibit.

A GOOD SHOWING FOR AN "OFF YEAR."—"As a result of cultivation, girdling and spraying, I have already sold 605 bushels of apples this off year, and have about 200 bushels left. Apples have been sold mostly at home and have brought 50 cents to $1.25 per bushel. I regard spraying as an absolute necessity."—E. H. S. DARTT.

OUR DELEGATE AT AMERICAN POMOLOGICAL SOCIETY MEETING.—Prof. S. B. Green represented our society at this meeting in Buffalo the middle of September, and reports a occasion of sufficient interest to hold him there every session. His report of the meeting is to be found elsewhere in this issue. He was honored with the chairmanship of the committee on seedling fruits, perhaps in recognition of the interest he and the society he represented there are taking in the subject.

SEEDLING APPLES AT THE WINTER MEETING.—There will be an unusual show of native apple seedlings at the coming annual meeting. Mr. Lyman will exhibit a large collection of his Wealthy and other seedlings. Mr. A. Wilfert, of Cleveland, will exhibit the seedling varieties shown by him at the late state fair. Bring out the seedlings! Special premiums will be offered. See Secretary's corner, November number.

FORTUNATE KANSAS.—"The fruit crop of the State, comprising apples, pears, peaches, plums and grapes, is very promising, and, with good weather, will be abundant in all fruit-growing counties. Some have more than ever in their history. Apples, and in fact all fruit, is freer from insect depredations and fungous diseases than usual. There will be a larger proportion of first grade apples than ever. Trees generally in excellent condition, mainly owing to the excessive spring rains."

Topeka, Kan., August 21, 1901. WILLIAM H. BARNES, Sec.

FRUIT PROSPECTS THIS YEAR IN MANITOBA.—"Our currant and gooseberry crop was poor, also our red raspberry crop. Blackcaps were good; strawberries fair. Crab apples were very good. Large apples are an extra heavy crop for the age and size of the trees; I think we will have about twenty-five bushels of fine, large, clean apples. These are composed of about eighty varieties, but the heaviest croppers are Hibernal, Anisette, Blushed Calville, Repka Kislaga, Patten's Greening, Wealthy and Red Cheek. Our plum crop is very good, our heaviest croppers being Cheney, Yosemite, Wood, Wyant, Bixby and Rollingstone. We have a large number of plum seedlings bearing fruit this year for the first time. Some of them I think of some promise. Our Compass Cherry trees are also fairly well loaded with fruit that is coloring up nicely."—A. P. STEVENSON, Nelson, Manitoba.

HORTICULTURE AT THE MINNESOTA STATE FAIR, 1901.—What others say of it:

"This is not a good year for fruit. In fruit growing districts generally the crops are all the way from total failures to fair, but probably relatively better in Minnesota than elsewhere, though not up to the average here. Still, the fruit exhibit at the fair shows clearly that this has become a state of fruit growing on a large scale. The showing was creditable for size and quality of exhibits, and their arrangement was extremely pleasing and is worthy of the splendid building it is made in, the new Agricultural Hall."—FARM, STOCK AND HOME, September 15, 1901.

"There is a prevalent idea that Minnesota is not in the fruit belt, but a look through the display of the horticultural section of this great building would speedily set at rest that doubt, as over 3,000 plates of apples, grapes and plums, etc., were to be seen, notwithstanding the unpropitious season, which not only cut down the yield, but the quality. Still, the array was more imposing than last year, and quality apparently as good. Certainly everything had a tempting appearance. Apples led in number and represented over 200 varieties, plums of a hundred varieties following, and then grapes of forty or more varieties. The display of potted and cut flowers was bewildering in variety and beauty, and represented a value of not less than $5,000."—THE FARMER, September 15, 1901.

"The horticultural exhibit occupied about one-third of the great agricultural hall, and its display of apples, plums and other fruits was magnificent. Next year it is expected there will be a new horticultural hall as large as the agricultural building. Long tables filled with plates of apples, grapes and flowers demonstrated the possibilities in fruit growing of the state which Horace Greely once 'damned with faint praise' as very good, except that it 'can never raise apples.'"—THE NORTHWESTERN AGRICULTURIST, September 15, 1901.

"In this building a magnificent display of Minnesota grown apples was also made that gives one an idea of what Manitoba may do some day."—THE FARMER'S ADVOCATE, Winnipeg, Manitoba, September 20, 1901.

"The horticultural department presented the most artistic and in some respects the best display ever made. The new building gives plenty of room, light and opportunity for decorative display, and every advantage was taken of these facilities. The showing of apples was not only especially good for an off year, but both in size and quality would be creditable to some of the more distinctly apple states. This department works in close harmony with the Minnesota State Horticultural Society, with its 1,000 members, and it is through the use of this machinery that the display is improving each year."—ORANGE JUDD FARMER, Chicago, September 21, 1901.

Capt. J. N. Cross died suddenly Saturday morning, August 31st, in the height of his usefulness, and with apparently many years of work before him. As an earnest advocate of practical forestry he had become a co-laborer with the members of this society in the broad field which its work covers. His taking away at this time is most profoundly to be regretted.

His biography will appear in the November number.

CAPT. JUDSON N. CROSS,

LATE OF MINNEAPOLIS, MINN.

[See opposite page.]

THE MINNESOTA
HORTICULTURIST.

VOL. 29. NOVEMBER, 1901. No. 11.

In Memoriam.

CAPT. JUDSON N. CROSS,

MINNEAPOLIS, MINN.,

DIED AUG. 31, 1901, AGED 63 YEARS.

Judson Newell Cross was born Jan. 16, 1838, at Pogueland, Jefferson county, New York, on a farm bought by his grandfather, Theodore Cross, in 1818, from the agent of Joseph Bonaparte, whose American estate was in that region. Mr. Cross was the son of Rev. Gorham Cross, who was called the father of Congressionalism in northern New York, and of Sophia Murdock Cross. On his father's side he was descended from a long line of sturdy New England men, the family easily tracing its ancestors back to 1640, when the first member of the same name settled on the Merrimac river, near Lawrence, Mass. The old Cross homestead still belongs to and is occupied by a member of the family. Among the members of the Cross family were several revolutionary soldiers. Judson's mother belonged to the Murdock family of Townsend, Vt. Her grandfathers were revolutionary soldiers, and among her relatives were John Read of Boston, said to be the greatest lawyer that America produced before the revolutionary war, and Rev. Hollis Read, of Townsend, Vt., who was the first missionary to India and first translated the Bible into the Indian language.

Mr. Cross left home for Oberlin, Ohio, the day he was seventeen years old. After a few months at Oberlin college, on account of lack of means he went to Booneville, N. Y., to work in a store for his uncle. He taught school the next fall near Sandusky, and alternately studied at Oberlin and taught school until 1861, when he enlisted in the army. He was the second man to get his name on the roll of the first company enlisted at Oberlin. This was Company C of the Seventh Ohio Infantry, and Cross was made its first

lieutenant. He served through the West Virginia campaign under McClellan and other commanders, and at the battle of Cross Lanes, Aug. 26, 1861, he was severely wounded and taken prisoner. Later he was recaptured and sent home for surgical treatment.

He was made captain of Co. K in November, rejoining his old regiment early in 1863, but on account of his wound was obliged soon to resign. He then began the study of law at Albany, where he remained until June of that year, when he was commissioned first lieutenant in the Fifth Volunteer Relief Corps, promoted to be captain in October, and in April, 1864, was made adjutant general of the military district of Indiana. In July he was ordered to Washington and was made assistant provost marshal. He was occupied along this line until the close of the war, when he resumed his law studies at Columbia law school. He graduated from the Albany law school in 1866 and located at Lyons, Iowa, where he practiced law for nearly ten years.

He came to Minneapolis in 1875 and formed a law partnership with Judge Henry G. Hicks, to which firm Frank H. Carleton was afterwards admitted and still later his son, Norton M. Cross.

Captain Cross was elected city attorney in 1884 and served three years. He framed the patrol limit ordinance during his term of office and defended the same before the supreme court. He also inaugurated the litigation which resulted in the lowering of the railroad tracks on Fourth avenue N. He was a member of the first park commissioners of Minneapolis and in 1891 was appointed United States immigration commissioner to Europe.

During recent years he has been prominently identified with the forestry movement in Minnesota and is among the most prominent of those laboring for the preservation of forests in the United States. He was president of the Minnesota Forestry Association, 1899-1900.

He was the author and principal champion of the Forest Reserve Law passed by the State Legislature a few years since and at the time of his death was president of the Minnesota board organized under this law. Considerable land had already been acquired for forestry purposes by the board and its practical value in the advancement of the forestry movement demonstrated.

Captain Cross was a member of the John A. Rawlins post, G. A. R., of the Loyal Legion, Commercial Club and of Plymouth Congregational church. At Oberlin, Ohio, Sept. 11, 1862, he married Clara Steele Norton, of Pontiac, Mich. He is survived by his wife and four children, Kate Bird, wife of United States Engineer Francis C. Shennehon; Norton Murdock, Nellie Malura, wife of Theodore M. Knappen, and Clara Amelia.

THE WOOD PAPER INDUSTY.

H. B. AYRES, CARLTON.

American strides in the development of industrial appliances are hardly less in the line of paper making than in any other. There are now about 1,000 mills engaged in its manufacture, which turn out nearly 6,000,000,000 pounds annually.

In wood pulp making the advance has been especially rapid. The first patent was secured in 1844, by Keller, in Germany, and in 1858 improved by Voelter, in the United States. The first wood pulp mill was built in Franklyn, N. H. It started under the usual difficulties of introducing new material when expensive machinery was to be risked in its trial, and only by passing it off for rag paper could the first trial be induced. The result was a great preference for the new paper, especially when rapid printing was to be done. The general introduction of wood paper came in the later seventies, doubtless the result of investigations stimulated by the high prices of paper during the early sixties.

During this investigation almost every vegetable fibre has been tried for paper making. Aspen and pine seem to have been the first wood fibres to find favor.

There were in 1885 several processes for treating the wood. By one the material was chopped into small strips and then steamed. Its acids were neutralized by alkalies, then ground by revolving stones. Some treatments aided the grinding by softening the fibres and at the same time loosening them—such were the hot lime and soda ash processes. In these processes the wood was left in large blocks, and after soaking was ground on the rims of revolving stones under a stream of water. The grinding was not across but parallel with the grain of the wood.

The field once opened, endless patent appliances for grinding and digesting wood lay at the choice of the manufacturer, especially in America, and here unquestionably the industry has led—and the American manufacturer has little to learn by a study of European methods.

Here, too, one has in our remaining primeval forests and in the possibilities of our non-agricultural lands, interesting fields for pulp making. In choosing a site for such work, power accessibility, water and wood supply are very important. Water power is, of course, best, and in Minnesota we have it. Accessibility by lake and established rail routes can not be rivaled elsewhere. Pure water can be had in abundance by proper care, and for a supply of raw material in northern Minnesota is found the greatest properties of

desirable pulp wood in the United States, probably in the world. Its suitability for growing these woods, combined with the non-agricultural character of much of the land, promises to develop the industry into great importance. If we are wise we will make it a perpetual and not a transient industry.

The cultivation of forests for pulp wood is a much simpler matter than the growing of log timber. The important points being location, transportation, a stand of desirable species and protection from fire. In our state is no lack of ground from which transportation is facilitated by stream or rail. Stands of aspen are indigenous and are even hard to prevent, while white and black spruce are among our hardiest trees. We may in a few years even hide the stumps of our former pine forests by a valuable new forest of pulp wood if (a great if, that has always stood in the road to our greatest prosperity), if we keep out the fire.

SOMETHING OF INTEREST TO BEEKEEPERS AND HORTICULTURISTS.

A discussion.

Mr. J. S. Trigg (Iowa): I would like to ask whether it is true that some people are born with a bee instinct; whether some people can keep bees and others cannot. In my own case I have a great respect for the bees, but they have nothing but a never ending hatred and animosity for me; they always sting me when I go around the hive. There is something very attractive about bees. For instance, you can go and lie down in a hammock on a warm day and listen to the humming of the bees and know that they are robbing your neighbor's orchard of all the honey it produces, and it always makes it of a better flavor to know that that neighbor is working hard in the hot sun planting corn while your bees are making a matter of $2.75 a day for you, and you have nothing to do but to lie there and take it all in. That feature commends itself to me. I know nothing that equals it, unless you have a hundred old hens and you can lie down in the straw stack while they shell out a couple of dollars worth of eggs for you to take to the city and sell. You can rob a bee time and again, and it does not mind it, but he does sting, so I cannot keep bees. What the reason is I don't know; I would like to keep them if I could. If some beekeeper would tell me the fault I would be glad to have him do so. I presume a man has to be born the bee way or there is no use trying to keep them. Thus it might be said I don't like their way of government. They have a big

army of drones who do nothing but sit around, and they have an army of workers who work and do nothing else, and that is not the sort of government that commends itself to me. I do not know whether we should eulogize the bee too much, still I would like to keep them if I could, and I would like to know whether the fault is with me or the bees.

Mr. Russell: It is a very well known fact that beekeepers don't know very much anyway, or, perhaps, they would not be beekeepers. The form of government, as I understand it, of the bee hive is a thorough democracy. It may be somewhat out of place to call the mother of the hive a queen. She is not a queen in the sense that I understand it; she is not a ruler, she is simply ruled by her colony; they are the governing body, and she has to do as they wish. It is a nice thing to lie in the hammock and listen to the humming of a hundred colonies of bees while they are piling up honey, but that is a sort of phantasmagoria; the beekeeper has got to hustle as well as anybody else. As to robbing your neighbor's orchard, I deny that charge. The bees go into the orchard and take away the waste product, but they pay a good deal more than their way to the fruit grower; they give back a good deal more than they carry away in the shape of honey. The other matter about being stung—I think it is the gentleman's own fault. It is not the principal business of the bee to sting; in fact, it seldom does sting unless it is provoked, and the beekeeper knows, although he cannot convey that knowledge to anybody else, when a bee wants to sting. When the beekeeper knows a bee wants to sting he governs himself accordingly, but the fruit grower strikes at the bee and it stings. That has to be learned by experience.

Dr. E. K. Jacques: I believe that almost every person may handle bees if he will. They must become accustomed to the bees, they must have confidence in themselves, they must know how to proceed. Sometimes a very nervous person will get into a flutter by the sharp note of the bees, but I believe almost any one may handle bees. Bees never go into your neighbor's premises, into his fruit for the purpose of doing damage, and the thought of our friend that he liked the idea of a colony of bees laying up $2.50 worth of honey a day by pilfering it from his neighbors, by taking something that does not belong to them, I deny. They go there to bless and not to curse, and I should look upon it in that light. I am glad to see that the fruit growers are beginning to realize the fact that the bee is their friend.

Mr. J. S. Trigg: When I go near a hive and a bee flies up and lights on the end of my nose, is that an indication that he wants

to become acquainted with me, and shall I let him stay there until he sees me? (Laughter.)

Mr. Russell: If the beekeepers think they know anything for a certainty, anything they do not guess at, it is that bees do not injure fruit. I have had some correspondence this fall with a fruit grower in a neighboring state. He keeps bees and also raises fruit, and he claims that the bees destroyed a considerable amount of his grapes this past season. I don't know whether I can convince fruit growers or not that they are mistaken, but I know they are. I think he guesses at it somewhat. I would like to hear from the beekeepers who believe it is impossible for a bee to injure sound fruit. No doubt there is some one who has given the subject attention and knows.

Mr. Jno. Freeman: I have from my earliest youth wanted to keep bees. My father, in Maine, was keeping them in quite large quantities, but I have been unable to keep them, from their enmity toward me. They are sure to sting me, and their sting poisons my system. Is there anything in the fact that I have read many times that a person who perspires freely is more likely to be stung by the bees?

Mr. J. S. Trigg: He is quite apt to sweat after he has been stung. (Laughter.)

Dr. L. D. Leonard: I have a theory on the subject, but I do not know whether it is a true one or not. That is, that a man who works among the bees is impregnated with the odor of the hives, so that no matter where you meet that person, if he has on the clothes in which he worked around the bees, you can smell the odor of the hives in the clothes. I believe there is that difference and that the bees can recognize one person from another by sight; I am perfectly sure they do it in some way, because I may have a man with me whom they will sting, while they don't offer to molest me. I believe it is due to the fact that my clothing is impregnated with the odor of the hive, and that familiar odor is sufficient to stave off the anger of the bees; whereas a man who comes around with a strange odor will be stung or is more liable to be stung. Now, that is my theory on the subject, and I give it to you for what it may be worth.

Mr. John Penney: My theory is that it is the smell that causes the enmity of the bees. Some people have a different smell from others. I can go and end up a bee hive sometimes, and the bees will light right on my hand just as if they were going to sting, and they will sit there a while and then fly away again. They don't like a horse. Just the moment they get the smell of a horse they seem to hate him and make for him, but a man can go right up to the hive,

and they will pay no attention to him. I had some bees I was going to shake out of a hive, and they got angry in a minute, and my hands were just covered with bees. I staid there a moment, and in a short time they were just as quiet as could be, but for a moment they were savage. At another time they were swarming, and they were up quite high in a tree, and I shook them off. When they were coming down it made them quite savage, and they went for me for a minute, but they quieted down right away so I could do almost anything with them. I think it is the smell of a person more than anything else that they notice. Different persons have different smells, and they can tell the difference.

Mr. H. G. Acklin: There is a great difference in the docility of bees, the same as one finds in cattle and sheep. Quite a number of people have been through our apiary, and our little girl makes that her play ground, and a hundred or more visitors are there every summer, and none of them have been stung. The students visit us, and I do not think any of them have ever been stung. If you get a colony of the right kind of bees I do not think you will have much trouble on that score.

The President: What kind have you?

Mr. Acklin: I have the Italian.

Mrs. L. A. Alderman (S. D.): I would like to ask the question whether bees have anything to do with disseminating blight. One of the gentlemen said that they only came to bless, but I think I have had trees that were entirely sound infected with blight from the bees.

Mr. J. S. Trigg: What kind of blight?

Mrs. L. A. Alderman: Twig blight.

The President: How do you think it was carried there?

Mrs. Alderman: By the bees when the trees were in bloom. Two years ago we had a third of our orchard blight when it bloomed. It was the worst season we ever had; we had trees on which the bloom was entirely blighted.

Mr. Trigg: Did it ever occur to you that the blight is not an active poison?

Mrs. Alderman: Prof. Vesey told me that bees were not responsible, and I think the gentleman is mistaken, that it is an active poison. The blight was not in active operation before the bloom was there.

Mr. H. G. Acklin: I see Prof. Green is present and perhaps he can give us some light on the subject.

Prof. S. B. Green: I think this lady has told about all there is about it. It seems as though the thing might be possible, but the

charge remains yet to be proven. The charge has been made but not proven.

Dr. L. D. Leonard: How about the blight at the time of bloom?

Prof. Green: We sometimes get it very early. Sometimes we get it at the time the flowers appear, and we may get it later. The charge remains to be proven that the bees affect the flowers, and I don't think you need stop keeping bees on that account. If the charge is not proven the bees cannot be condemned.

Mr. E. R. Pond: Do you know of any evidence against the bees?

Prof. Green: If you have a tree that has the San Jose scale it might have been carried from one tree to another by birds. Birds may be as likely to carry disease as bees or other insects. Insects may carry disease from one tree to another under certain conditions just the same as mosquitoes have been known to carry malaria. I think bees are all right.

Mr. J. S. Trigg: This lady tells us it was not fire blight as we understand it. She says the blight was simply on the blossom bud.

Prof. Green: It is what we call spur blight. It comes early in the spring; it is a form of fire blight.

Mrs. L. A. Alderman: Is it not the same form as fire blight? Our theory was that the bees had disseminated it by visiting other orchards and had carried this same blight to the blossoms.

A VERY INTERESTING FAMILY OF TETOFSKY SEEDLINGS.

E. H. S. DARTT, OWATONNA.

About fifty years ago I got the Tetofsky apple from Ingraham Gould, a nurseryman of Beaver Dam, Wis., who had it on his list under the name of Russian crab. He got it from a man in Milwaukee, who had received it from a man in Canada. About five to eight years later it was boomed as Tetofsky. I sold 2,000 scions to J. C. Plumb, of Milton, Wis., for $38. About thirty years ago I planted Tetofsky seed at Owatonna, Minn. One tree of fine growth and appearance I called Dartt's Hybrid. From its habit of growth and the size and color of its fruit I thought it a cross with the Hislop crab. The fruit is rather large for a crab but much too small to be called an apple. It is beautifully colored and of excellent quality for canning and preserving. The original tree is now in fine condition. It has never blighted badly, though standing within thirty

feet of a very large Transcendent. One year it bore fourteen bushels of apples. This variety is now called Dartt for short. I have twenty-seven varieties of its seedlings on the tree station, nearly all of which are fine looking trees. Many of them have been brought into bearing by girdling. Dartt No. 22 is a beautiful red apple of medium size and good quality. Dartt No. 13 is of full medium size, slightly conical, with long slender stem, and promises to be a keeper. Now that we know that all new seedlings average small and that we may reasonably expect much increase in size in later productions a very interesting field opens up before us. If we plant the seeds of Dartt No. 22 and Dartt No. 13, what shall the harvest be? Shall we get apples as big as pumpkins and that will keep a whole year? Very likely, for pumpkins do not always grow large, and the Ditus Day seedling keeps two years.

KEEPING BEES ROR FERTILIZATION.

A discussion.

Mrs. H. G. Acklin: Is it advisable and practicable for a horticulturist to keep a few colonies of bees for the proper fertilization of fruit?

Mr. Parks: I can give no definite facts, but in a general way I should say it would be. We have kept bees and fruit for thirty years. A few years ago I lost all my colonies but one, and that being very weak I had but few bees, and I had a light crop of fruit. I laid the fact to a considerable extent to the loss of the bees. I should say it was decidedly preferable to have bees for the proper fertilization of fruit.

Mr. E. R. Pond: I can speak from experience also. I have kept bees all my life, but I know in our neighborhood there are greenhouses where they make a practice of keeping a swarm of bees in the greenhouse in order to fertilize the flowers. They have to purchase them every fall as it uses a colony up during the winter. They found it profitable to do that, so I think it must be quite profitable to keep bees for fertilizing purposes.

The President: The first three or four years I was in this territory no one could raise a squash or pumpkin. They are fertilized mainly by bumblebees, but there were no bumblebees there then. But after the bees came we had no trouble in raising them. I think Mr. Patten could tell us something about that.

Mr. C. G. Patten (Iowa): I have little to say upon the subject as I do not keep any bees, but I should always advise my neighbors to keep bees. In a general way we know that pollen is required

to pollenize the different varieties, and that the pollen of one variety is much more susceptible to a certain variety than that of another. The bees in warm weather flit around from one tree to another, and they distribute the variety of pollen that is just adapted to the variety of fruit in the orchard.

The President: Some are pollenized by the wind, some by the pollen simply falling as is the case with corn. A great many depend upon the bees and other insects. I was very much interested in watching the bees in my Caragana trees. The aperture in the flowers was so small that they had to raise the upper petals to get in, and when they did raise them up a portion of the pollen adhered to the back of the bee, and when he went to the next flower he left a part in that flower. I watched where they went, and I could see how nicely that was planned for the bees to do that work that never would have been done in any other way.

Protecting Trees from Rabbits in Winter.—Rabbits have rarely harmed trees set on land bare of grass and weeds, but seemed to take especial pains to ruin trees on land containing a heavy growth of clover. My conclusions are that the less protection we give rabbits by way of grass, weeds and other hiding places in the orchard, the less liable they are to disturb the trees. The orchards can be easily protected by wrapping the trees with old newspapers, straw or cornstalks. The latter can be tied close around the trees. I prefer the paper. It should reach up the tree two or three feet, so the rabbits cannot gnaw above the unprotected part in case of a deep snow.

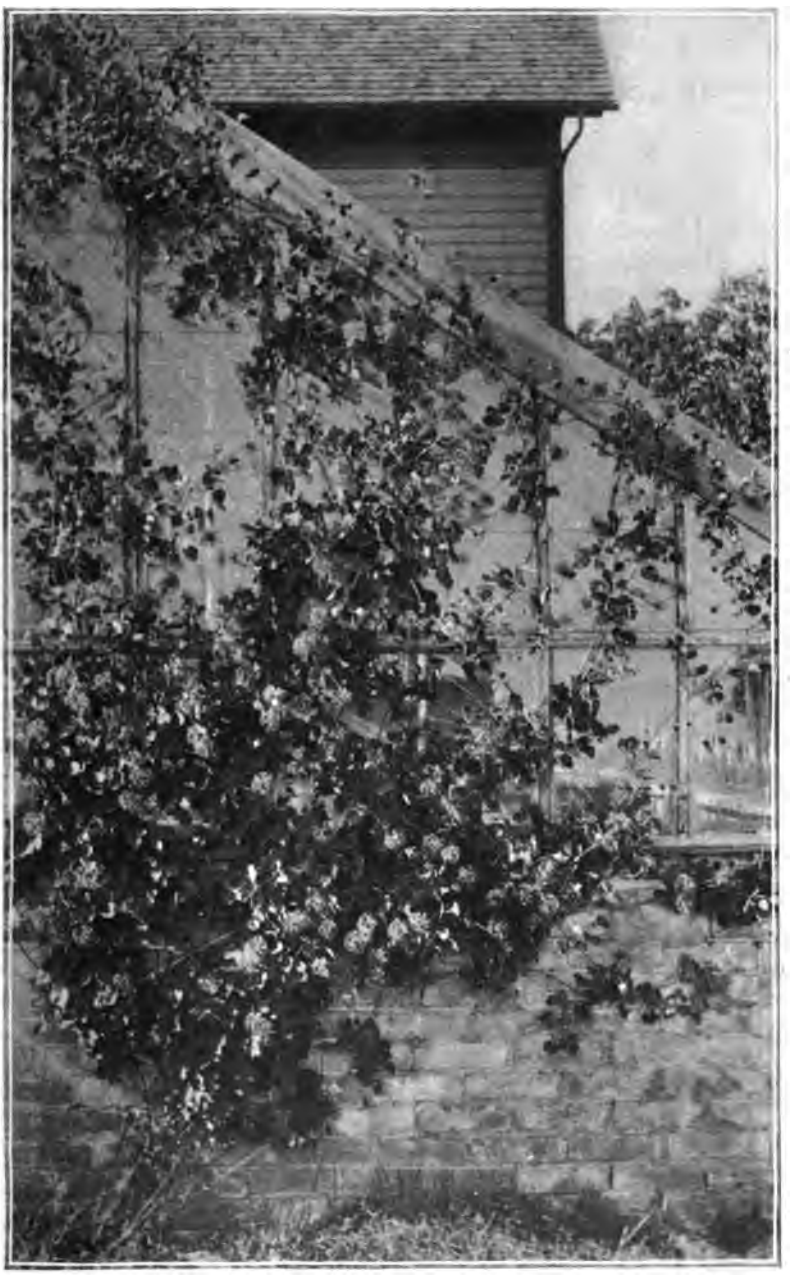
Tying the papers with string is rather slow and unhandy. I now use wire. I procure rather small wire, such as is used for baling hay, and cut it into three or four inch lengths. When the paper is wrapped around the tree two or three pieces of the wire are bent around over the paper. It is not necessary to twist the ends of the wire together, as it should be stiff enough to hold the paper when bent until the ends come together.

The wires are easily removed in the spring and are put on much more rapidly than tying with string. I double the paper in strips of several thicknesses and place them up and down the tree. This should be just wide enough to reach around the tree and by this means several thicknesses are secured at one time. Some growers smear the trunks of the trees with soft soap, oils, etc., but I prefer the plan just described.—G. W. B.

CLEMATIS COCCINEA.

PROF. S. B. GREEN.

This is a beautiful little climbing clematis from Texas. It has very slender habit and pretty foliage, and produces a large number



CLEMATIS COCCINEA.

of scarlet flowers throughout the early part of the summer. It seems to be perfectly hardy, and well adapted for places where a delicate rather than a heavy foliage climber is wanted. After the flowers have gone, the fruit clusters are quite as ornamental as in most other plants of this class.

THE SOUTHERN MINNESOTA HORTICULTURAL SOCIETY.

JONATHAN FREEMAN, DELEGATE, AUSTIN.

The eighth annual meeting of the Southern Minnesota Horticultural Society was held at Austin, Nov. 20, 21 and 22, 1900.

Although I was elected a delegate to your honorable body at the previous meeting held at Albert Lea, still, because of a trial change of time of meeting, my successor will pardon me for apparently and necessarily trespassing upon his field, in reporting the acts and doings of our society to the present.

Although the organization was a full fledgling from its first meeting proper, still, as told by our worthy friend and its godfather, Mr. C. Wedge, the surroundings at its birth were rather unprepossessing and discouraging. But, as suggested before, after it had an existence, through the nurturing care and strenuous efforts of its Wedge, Kimball, Hawkins and others, in connection with encouraging visits and actual vital assistance from active horticulturists in other parts of our own state, and especially from those in several northeast counties of Iowa, it has grown and labored most of the time like a young athlete. As a state organization, in numbers I believe you stand at the head of the class, and we opine that we are assisting you well in retaining that position by our numbers of ninety-seven, sixty-three and seventy-two, severally, for the years '98, '99 and 1900.

Nevertheless we are crest-fallen when we observe our decrease instead of increase in numbers since 1898. We are anxiously inquiring of each other, "What's the matter?" Why are we also illustrating the facts of history and astronomy, by an "ebb and flow of tide," or the "perigee and apogee of the moon," in human and earthly affairs? And while this is true, those who do attend generally acknowledge that the programs as prepared and executed have continued to improve, being deeply interesting and highly instructive.

Now, because of the wide expanse that the state organization covers, don't you flatter yourselves too much and be led to depreciate us somewhat because of our limited field. Please remember

that Fillmore, Mower and Freeborn counties combined cover a territory over two-thirds larger than the state of Rhode Island and some larger than the state of Delaware. The above states yield large quantities of fruits and vegetables.

Knowing something of soil, climate and general conditions of all these sections, allow me to express judgment, that, providing the demand ever exists, our district of the three counties named can and will produce much more annually than either of the states mentioned. Now, aren't we "some pumpkins," and are not our possibilities beyond measure? Our opportunities are fine, and some of us are beginning to improve them. We gladly acknowledge the much that we have received from the state society. We greatly appreciate the assistance from our brother horticulturists from northeastern Iowa, even if some of them are nurserymen, who necessarily are watched and criticized by the farmers, as well as those occupying our own field. We are not in the back seat as regards nurserymen. The few in our field are doing a healthy, growing business.

All of the following figures are for the years '98 and '99, as I have been unable to obtain them for the present year.

Our most prominent nurseryman, with whom most of you have had a favorable acquaintance and association for years, sold in the spring of 1899 nearly 27,000 fruit trees and nearly 165,000 shade and forest trees. Since then he has been largely extending his metes and bounds and, doubtless, increasing his sales. Several others are doing an increasing business. And we are on the border land of several live, extensive, thorough and helpful dealers in northern Iowa. It is estimated that within our limits there are at least an average of twenty fruit trees, in a thrifty condition, per one quarter section. The level prairie sections of the three counties, as regards soil, subsoil, etc., are as well adapted to fruit of all northern varieties and forest trees as any known prairie section, and certainly most of Fillmore county is as well adapted as any of the old fruit sections of the east as far as soil, location and exposure are concerned. There are many farmers averaging annually twenty-five to one hundred bushels of apples, largely as yet in alternate years, and a few from five hundred to three thousand bushels on such alternate years, with a grand average perhaps of ten or more bushels per quarter section.

A correspondent from Fillmore county says, "Could the crop for 1898 of Fillmore county be known, it would be immense and would surprise the natives. Of the 8,804 bushels mentioned, above 5,150 bushels were grown and shipped by three individuals,

and 3,654 bushels were bought and shipped by one merchant, and this is only one drop in the bucket of what the whole county produced." Another from Mower, "One farmer, in 1898, grew eight hundred bushels, and the county, as a whole, grew its share of the estimated 800,000 bushels for the state." Another from Freeborn, "Should estimate that not far from ten bushels of apples were raised on each quarter section." Of course the above figures are for the known abundant year of 1898. The yield of 1899 was from no per cent to perhaps fifty per cent for individual farmers. The yield for 1900 would have made a good showing if it had not been for the early dropping, just as the eastern crop would have been immense if the great wind storm had not done its premature harvesting. As for berries and vegetables, if only the effort is made we need no sympathy from and ought to offer no excuse to any other section of our wide domain.

Now, brother members of the state society, I think you will agree with me, that our district is spacious enough, it's soil and other requisites are sufficiently ample and that some members of our society are fully alive to the interests of horticulture and able in the discussion of topics relating thereto: but why cannot the present nucleus of members succeed in getting a much larger per cent to attend our meetings and thereby become more deeply interested in this branch of farming? Tell us how to arouse the lethargic, to allay personal pique arising from business, political and social experiences, to weaken ultra-selfishness that would not bestow a little on another while receiving much for oneself!

I must stop moralizing, yet facts are what we must face in this world, not theory. It is well for us at these annual gatherings to enjoy the good things of intellectual and social feasts, but it is more important that we carefully, justly and clearly consider ways and means for more improvement and greater success in those lines of effort and fields of action where there seems to be the most friction and surrounded by many unfavorable circumstances.

Why cannot there be more local societies better supported, thus extending the good work into many fields, the parent society thus stronger for its special sphere of action?

We ask you for light, help and encouragement, not only for our own success and usefulness, but that other sections of our grand state may be induced by our good and effectual works to arise and organize local societies for the upbuilding of the good cause locally as well as the strengthening of the parent society.

PROFIT IN HORTICULTURE. WILL IT PAY HERE?

C. F. GARDNER, OSAGE, IA.

(Read before the So. Minn. Hort. Society.)

Mankind is never satisfied. A few years ago it was generally believed that we never could grow apples of any kind in this latitude with profit; they are now grown in such quantities, every other year, that thousands of bushels rot on the ground, mainly through the carelessness and ignorance of the grower, who fails to pick and ship them to market before it is too late. There is money to be made with the apples now grown if they are properly handled.

We have found that we can grow apples here, but we are really in the first stage of the business; the same as it is in all new countries, the first to succeed and do well are summer and fall varieties. The winter varieties will come in due time if we have a little patience and attend to our business. They will be produced right here at home, in the northwest. There are kinds already known, seedlings produced by horticulturists that give great promise of helping fill up our list of winter varieties.

Pears and all varieties of the European plum will not pay for the room they occupy, except on the grounds of the professional horticulturist to be used for the purpose of growing blossoms for cross-fertilizing purposes. Such plums as the Wyant, Wolf, Surprise, Stoddard, J. B. Rue, Rollingstone, Rockford, Miner, Hawkeye, Hammer, Forest Garden, Comfort, De Soto, Bixby, Aitkin and Adams can be grown with profit anywhere in this latitude. When I say this, I mean if they are planted on land suitable for the plum. The plum needs plenty of moisture, and must have it, to succeed well. Avoid planting on dry knolls. They will do well on all first class corn land, cultivated and kept clean. After the trees are started, all cultivation should be shallow, never cutting the roots of the trees. These plums readily bring $2.00 per bushel in our home market.

There is one plum we have been fruiting for two years that, in my opinion, is far ahead of anything yet introduced, and I predict that in less than five years more trees will be sold of it than of any other plum now known. It originated at Ames, Iowa, a few years ago, and is the product of crossing the blossom of a De Soto with pollen from one of the Japan plums. It is as hardy as the De Soto, the fruit is of fair size, and its quality is not surpassed by any of the finest European plums. It is a freestone, the skin absolutely free from astringency, no sour deposit around the pit; in fact, it is the ideal plum. It will soon be on the market. It has been named Japan Hybrid No. 2.

Will horticulture pay here? No matter what business one may be in, if he is successful he must understand that business. In horticulture he must know the value of fertilizers and how to apply them. He must know how to fight insects and bugs. He must study out and adopt the best way to conserve moisture. As a rule, we suffer more from lack of water than from excess. When this rule is reversed, he must understand how to get rid of it. He must grow low headed trees, and in order to do this he must understand the art of pruning. Bean pole pruning will not do for this climate. No one denies but what it pays to grow small fruits here; it also pays to plant out windbreaks, or shelter belts, ornamental trees and shrubs, to protect and ornament our homes. Horticulture carried on by the intelligent, observing man will pay, but not otherwise.

As for quality, cultivation alone will improve it wonderfully, in all varieties of fruits. Good cultivation and thinning the crop cause all the difference between those superb specimens of fruit which grace the tables in our show rooms and such miserable fruit as we sometimes see borne on the grass grown, weed choked, mice gnawed trees of the slipshod farmer's grounds, planted out with hardly the expectation, but rather with a sort of dim hope, that they would grow and take care of themselves. Good fruit is always grown under the eye of vigilance and industry.

Mr. Thomas said, "The assertion may be made with safety, that more trees are lost from neglected after culture than from all other causes put together. Horticulture rightly directed will pay here. In addition to growing fruits, let every one owning land plant out trees and shrubs, the number depending upon the space desired to ornament—not crowded together nor in straight lines, but naturally and judiciously, allowing glimpses of distant views, and yet sufficiently near the residence to afford a refreshing shade. Clustered in the nooks and corners, let the various flowering shrubs perfect their bloom in masses, so arranged that in the varied tints an added charm may each succeeding day be seen and felt. Along the borders of the walks, place neatly executed beds of flowers, few and plain, yet filled with choicest plants. By such means we make home dearer to ourselves and weave attractions around the spot that yield a fund of pleasure unsurpassed. And as the years roll on, each plant and tree therein becomes to us as a trusty friend, endeared by sweet associations of the past and bound by recollections of the care bestowed upon its younger growth."

MY WAY OF LAYING OUT THE VINEYARD AND PLANTING THE VINES.

A. D. LEACH, EXCELSIOR.

Having decided on the amount of land to be planted and having put it in good condition as for a crop of corn, provide yourself with three or more stakes (as the lay of the ground may require) nine feet long. Carefully mark each stake at seven and one-half feet from the bottom end. Stick them up in a straight line across the piece where you want the first row. Then with a steady team and plow, make a straight furrow where the first row is to be, using the stakes for guides, and moving them over as you come to them, seven and one-half feet for the second row. Having reached the end of the first row, measure off for the second, marking the ground where that row is to start; then set that stake over for your guide in the third row, follow the stakes back, moving them over as you come to them as before. In marking the third row, set the stakes over nine feet or the full length of the stakes, making the space between the third and fourth rows nine feet. After the fourth row is marked two more rows seven and one-half feet apart,—then one nine, and so continue (making the distance between every third and fourth row nine feet) until all the rows are marked.

Then turn and cross-mark where the vines are to be set in the same way every eight or nine feet—as you may prefer. I like nine feet apart best for most vines.

If the land should be too steep to cross-mark, then the best way will be to set the vines by a pliable wire-line stretched along the row. Carefully mark the distance apart you want your vines by winding a thoroughly waxed string two or three times around the wire, and tying firmly so it will not slip. Then set your marking stakes across the rows about two feet outside from where you want the first vine in each row, in a straight line. Now procure a good strong stake and fasten your wire firmly to it, as far from the first string as your guide stakes are from the place where you want the first vine, in each row. Drive your stake in line with your guide stakes, and also in line with the first row. Take the wire along the row to the other end of the plat, fasten it to another good stake, stretching it tight along the furrow or row and about a foot from the ground. If the ground is uneven, stakes may be driven along the row where needed, and the wire fastened to them with staples to hold the wire up or down, as the case may require. I like the furrowing much the best where it can be done, as it does away with all sighting and line-stretching, and saves some digging for the vines, if well done.

My reason for the wide rows is that I have found it very diffi-

cult to fertilize my grapes when they need it, as the rows are too narrow to drive through with a wagon. With this plan it can be easily done, and have the same number of vines to the acre as if set eight feet apart, and I do not think it would be any detriment to the crop.

I will say here that I prefer a south or east slope for grapes, and some protection on the north and west is desirable, but not essential. The rows should always run parallel with hill or slope, to prevent washing.

If the rows run east and west, I always train the vine to the east, and if north and south, to the north.

In planting the vines we will start with the first vine on the east or south side of the plat, as the case may be, where the first vine is to stand as shown by the marks, or wire, and dig a sloping hole, deep and broad enough so the roots can be well spread, and as far down as they will reach.

Place the vine in the hole two or three inches deeper than it stood in the nursery, spread and straighten the roots carefully, and work some of the soil among them until well covered. Fill up the hole, packing the soil firmly with your feet and then throw an inch or so of loose soil over the top to prevent evaporation.

Pass to the next vine and set in the same way, always being careful that the top of the vine is just where it should be, and so continue until all are set. Then level the ground with the harrow.

IRRIGATION.

C. W. SPICKERMAN, EXCELSIOR.

In my opinion, irrigation in Minnesota will have to be experimented with considerably before it can be brought to a state of perfection.

Water should be at command equal to a good shower and then applied so to get at the roots of the plants to be irrigated. If this cannot be done more harm will probably be done than good. When plants begin to get dry the feeding fibers or roots near the surface die or become dormant, and at this time if a small amount of water be applied the roots put out a new growth and then for the want of more water die, which exhausts the plant instead of benefiting it. Also where a small amount of water is used so it does not reach down to moisture below it does not form a chain or connection with moisture so to produce capillary attraction, and the hot sun coming down causes a hot vapor or steam which seems to cook the plants, making them wilted and sickly looking, and later on if it comes on to rain they do not seem to do well. Better have one plant on one

acre well watered than to have ten plants or ten acres with a little water sprinkled on the surface.

The mode of applying water seems to be done in different ways by different people. Some spray or sprinkle a little water on the surface of the ground. Others remove some of the dry earth near the base of the plants and then apply the water and as soon as it is well soaked in return the earth, to prevent baking and evaporation. In my judgment this is a very good way to do with vegetables.

With strawberries, raspberries, blackberries and all small fruit in general I have had the best success in making a little ditch along the row with a hoe, applying the water to the ditch at the highest point in the row and letting it run along the ditch (on clay soil) from two to four hours.

A word in regard to the proper time to begin to apply water. Some hold to the idea of not letting the plants get dry, like the man who said he never was hungry for the simple reason he always ate before he got hungry.

My experience is that strawberries if well mulched, and shrubby fruit if well cultivated, will go along in good growing condition even if there is no rain until about one week before the fruit begins to ripen. Then give the ground a good soaking around the base of the plants, after which keep the ground loosened up on the surface, and in about ten days give them the second wetting, which will carry them through to completion of fruiting or till rain begins to come. I think if there was no later rain if one would cut out the fruiting canes immediately, as soon as the fruit was picked, and keep up a fine surface cultivation they would produce good canes for fruiting the next season.

As to irrigating trees, I have had a limited experience, but the experience I have had brings me to the conclusion that fruit trees should not be left till they are very dry and then give them a soaking around the base of the tree only, as it is liable to cause a tree heavily loaded with fruit to shed its fruit prematurely. In my judgment a two year old should have a shallow ditch about one foot wide two feet off from the base of the tree and apply the water to the ditch. For trees ten years old or more I would suggest to make the shallow ditch two to three feet wide and from four to six feet from the base of the tree and fill it with water. The next day fill the ditch with earth or some heavy mulch and let it remain from two to four days, then remove the covering and water again the same as before and continue to water in this way until it rains. In irrigating in no case would I put any water on the leaves or stalks of trees or plants—simply apply water to the ground that comes in contact with the roots.

BLACKBERRIES, CURRANTS AND GOOSEBERRIES FOR MINNESOTA.

A. O. HAWKINS, CHOWEN.

I will not describe any but such varieties as have been well tried and have proven the most satisfactory in our northern climate. My experience in fruit raising has been on a clay soil in the vicinity of Minneapolis.

BLACKBERRIES.

Snyder and Ancient Briton are among the best. The Snyder is well known and one of the hardiest and best for Minnesota. It is early, sweet and juicy.

Ancient Briton is not quite as hardy as Snyder but yields better. It produces large fruit stems and good sized, firm berries of fine quality that carry well to market. One of the best for either home use or market.

CURRANTS.

The most satisfactory kinds for home use are White Grape, Red Dutch and Stewart. The most profitable varieties for market are Long Bunch Holland, Prince Albert and Red Dutch. White Grape.—Fruit large, yellowish white and of excellent quality; bush a hardy, vigorous grower and enormously productive; should be the first currant planted for home use. The only fault I have with this variety is its color. It can not be sold in large quantities on the markets.

Stewart.—Berries bright red, firm, large, late and of the best quality; bush an upright, healthy, vigorous grower, attaining a large size. This variety more than any other requires a rich, heavy soil and good cultivation. It is productive, but the berries cannot be picked rapidly on account of the leaves.

Long Bunch Holland.—Berries medium size, bright red, firm, very late and of inferior quality; bunches long, close together and well hidden in the center of the bush. It can be picked very rapidly. For market it is one of the most profitable. The bush is extremely hardy and long lived. It is a very vigorous grower and attains a larger size than any other red variety I know of. It does not fruit heavily till five or six years old.

Prince Albert.—Very much like the Long Bunch Holland. Fruit a very little better but not as attractive, being a pale red.

Red Dutch.—This old, well-known sort is still one of the best for either home use or near market where taken care of properly. They must be kept in vigorous growth so the leaves do not drop off before the berries are picked.

GOOSEBERRIES.

Red Jacket.—I believe this variety is the coming gooseberry for Minnesota. It is a strong, healthy, vigorous grower, and hardier than the Downing. The fruit is about one inch in diameter, red, smooth and of good quality. It is quite thick skinned and carries well to market, even when ripe. I have had it fruit four years. This variety will hereafter probably be known by the name Josselyn (the introducer), or Josselyn Red Jacket, because there is an inferior sort sent out from England by the same name. I have tried the Houghton, which is too small to sell well.

The Downing is not quite hardy enough for northern Minnesota and often mildews. The Smiths, Hicks and Industry are almost worthless here, especially the last two named.

PLUM CULTURE.

L. Z. SMITH, MANKATO.

From the numerous quantities of wild plums found on every hand throughout the northwest it would seem to the casual observer that the growing of budded or grafted plums would be an easy matter. While it has been conclusively demonstrated to the satisfaction of all horticulturists that certain varieties of natives can be successfully and profitably grown in the state, yet we are aware that lots of money and labor has been lost in the attempt to secure a successful plum orchard. We shall not try to enumerate the numerous causes of failure, but will endeavor to give what we believe to be a reasonable method to produce and care for a plum orchard.

As to location I would prefer a light loam with a clay subsoil on a north hill slope; however, if such a location is not to be had, plant in the most convenient place and try to add by artificial means what nature has failed to provide. If planting in light, slow soil with clay subsoil, I would use a three year old tree budded or grafted on native roots, as they are undoubtedly stronger in penetration and will furnish more vitality to the growing stalk than French roots. Great care should be used in planting to see that good large holes are prepared, so that the roots will have loose, soft dirt to adhere to, and be sure to get them down good and deep. Hundreds of trees are lost every year by not being planted deep enough. They should be planted three or four inches deeper than they were in the nursery rows, so that the crown or collar of the roots will not be exposed to atmospheric changes. Slant the tree slightly to the southwest; see that the roots are in a natural position and fill in with top dirt, press-

ing it firmly around the roots, leaving the ground slightly dishing toward the tree. If planting for commercial purposes, plant in rows ten to twelve feet each way and give them a shallow but thorough cultivation until the trees are large enough to partially shade the ground. If you notice an unusual or abnormal growth, which will sometimes occur in some varieties, cut them back slightly in the latter part of August. It will have a tendency to prevent blight or winter-killing. Examine your trees occasionally in the spring and summer and be ready with the sprayer to check the inroads of devastating insects that prey upon the plum family.

To the planter who only wishes to raise a sufficient quantity to use for home consumption good results can be obtained by selecting a dozen or so of the most promising native sorts. If the soil in the location is not too strongly productive, plant in a group and keep them constantly mulched, using old hay for that purpose, spreading it on, say eight to ten inches deep, over the entire surface of the ground. The mulching will not only serve the purpose of cultivation but will keep the ground loose and moist through the summer season, and also prevent cracking in winter by freezing. We are aware that mulching will create a harbor for injurious insects, but the proper use of the sprayer at the right time will do away with that danger. Such are the conclusions we have reached from our observations and experience with the native varieties.

As to the European and Japan sorts would say to the small planter, let them alone, for if you plant them your only reward will be the loss of your labor and expense. We are also aware that some experimenters have not only produced some fine samples of the Japan and European sorts but have succeeded by careful nursing in preserving the trees in a fair condition, but we do not consider them at all reliable for practical planting.

In conclusion, we desire to offer a few words of encouragement to any who might desire a plum orchard and who have met with failure in that line. Bear in mind that hundreds of plum trees are sent into the state every season that are not adapted to this latitude and are in a damaged condition on arrival. Perhaps you may have been so unfortunate as to get some of that class. Some of the drawbacks that caused your failure in the past might be overcome by new methods at the present time. Take our advice and make another trial by selecting a few of the best native sorts from some reliable source in the state and carefully following the instructions laid down by the state experimenters, and you will be rewarded for your trouble by a bountiful supply of rich, luscious fruit.

WILFERT'S WINTER SEEDLING APPLE.

ANDREW WILFERT, CLEVELAND.

It is an all winter apple, in quality equal to the Belleflower. It is a seedling of the Ben Davis, but the shape of the apple and the hollow core indicates that it is a cross between a Ben Davis and a Belleflower. The tree when young is an upright, vigorous grower, but after raising several crops of apples, from having such heavy loads to carry, the top becomes spreading, which gives the trees a fine appéarance. The seed from which this tree was grown was planted in spring of 1866. It was never known to blight nor be injured by the cold winters in thirty-five years. The original tree was destroyed when twenty years old by hogs undermining it. There are six trees in existence that the originator knows of, that were grafted in 1880, and they are considerably larger than Wealthy trees that were set out at the same time.

WILFERT'S WINTER SEEDLING.

LAYING OUT THE ORCHARD AND PLANTING THE TREES.

C. P. BLAIR, ST. CHARLES.

A country home does not seem to us complete without an orchard of a few trees, and we will try to give a few hints to the beginner as to what we think is the best way to proceed. The setting out of an orchard is a permanent improvement and ought to be carefully considered. The first thing to be considered is, what is the best location we have for the home and the orchard. Some prefer a northern slope, which you may not have. We do not think that a slope in any particular direction is a necessity. If you have land high enough to not be frosty, it will make a good location for an orchard. There are so many high winds and big storms, that we think that a protection for the home and the orchard is a good thing to have. We think that a protection on three sides of the orchard and home is very desirable on the north, west and the south sides. So few of our high winds and big storms come from the east that a windbreak on that side is not quite as necessary as on the other side.

Where you have a natural grove on any side be sure to save it as a protection for the home. Where a natural grove does not exist we think that it will pay to grow one to protect the home and orchard.

The land where you intend to set your orchard should be plowed in the fall, and in the spring it should be nicely pulverized with a disk.

I like to set apple trees in rows both ways, twenty-one feet apart each way, so as to cultivate the ground for a few years, while the trees are young. At twenty-one feet apart the trees will be in every sixth row, of rows three feet and a half apart. After the land has been thoroughly pulverized you can mark off the land both ways so as to set the trees in the checks at twenty-one feet apart each way. At twenty-one feet apart you can put ninety-eight trees per acre. We think that on the outside next to the protecting grove a space of at least two rods ought to be left vacant, and if the protecting grove is willows the space should be not less than four rods wide.

Be sure and dig the holes large enough so that the roots can be straightened out as they grew in the nursery. We like to set the trees at least three or four inches deeper than they grew in the nursery. Let the roots of the trees stand in water for an hour or more before setting out. Trim off all of the broken roots; trim off all of the broken limbs; also trim off and cut back fully one-half of the top of the tree to be set out. If the ground is not moist

enough, we like the plan of throwing in a half pail of water after we have the roots covered a little and then finish covering the roots. Soon after the trees have been set out mulch them with some coarse manure, so as to keep the sun and winds from drying up the soil around the young trees in time of drouth. I do not think that I ought to advise as to what varieties to get, but see what varieties do the best in your locality. Also consult the list recommended by the horticultural society for the state of Minnesota.

PLANT FOOD FOR HORTICULTURAL CROPS.

PROF. HARRY SNYDER, MINN. STATE AGRICULTURAL COLLEGE, ST. ANTHONY, PARK.

During recent years the attention of scientists has been given not only to the feeding of farm animals, but also to the feeding of agricultural and horticultural crops. There is a marked similarity between the subjects of animal feeding and plant feeding. In the case of animals, the influence which certain foods have upon the development of the body and the production of muscle, bone and fat are comparatively well understood. The laws which underlie the development and growth of plants are, in general, similar to the laws which govern the development and growth of animal bodies. In the case of animals, the effects of food are capable of being observed more accurately than in the case of plants under ordinary conditions of cultivation. This is because the food of animals is capable of being restricted to what is supplied by man, while in the case of plants nature supplies at least a part and in some cases all of the food.

The subject of the feeding of plants is an exceedingly interesting one, and our knowledge in regard to it has been enriched by the well known methods of sand and water culture experiments. As a result of numerous experiments which have been carried on by various scientists in this country and Europe during the last fifty years, the function, or part, in plant economy which certain elementary subjects take is now fairly well established, and the elements needed to enrich an impoverished soil may now be determined with a fair degree of accuracy, and with the proper methods of farming, including the rotation of crops and use of farm manures, there is no necessity for the use of concentrated or commercial fertilizers. For horticultural purposes, however, where large yields are desired from small areas, or when a special object is sought, as the forcing of a crop in any particular way, then commercial fertilizers are beneficial. In order to make a proper use of them, however, certain general

principles should be kept in mind. These principles simply conform to the general laws of plant growth. An indiscriminate use of the ingredients in commercial fertilizers is nearly akin to the indiscriminate use of patent medicines. A few simple home remedies, however, are often effective and valuable and can be safely used. So with commercial fertilizers, if properly used they give good results. One of the most frequent errors in the use of commercial fertilizers is the application of the wrong fertilizer. This causes an unbalanced feeding of the plant.

In the use of plant food in commercial forms it should be the object, (1) to supplement that which is in the soil and also (2) to assist the crop in obtaining some element which, possibly, it may have difficulty in assimilating. In case that one wishes to use concentrated fertilizers it should be remembered that nitrogenous manures have a tendency to produce large leaves, rich green in color, and to cause a growth of luxuriant foliage. If the plant is over stimulated with nitrogenous food, there is a tendency to cause prolonged growth of the crop. While nitrogen is one of the most essential and valuable plant food elements, it nevertheless produces an unbalanced growth when not properly combined with other plant food elements, or when used in excessive amounts. Take a potato crop, for example. Suppose that a heavy dressing of nitrate of soda and no other kind of manure were used. The result would be a large growth of vines and leaves, and with a good water supply the tops would remain green till late in the season. From the appearance of the foliage and vines, an abundant yield of tubers would be expected, but when the potatoes are harvested only a few small ones are obtained. The small crop is not due to the fact that nitrogen is of no value as a plant food, but it is due to the fact that the nitrogen has not been properly combined with the other essential food elements. If in place of part of the nitrate of soda some potash and phosphate compounds had been used a balanced fertilizer would have been secured, and a larger crop obtained. From the numerous soil analyses which have been made in our chemical laboratory, nitrogen appears to be one of the elements that is liable to be the most deficient in the soil. The bulletins of our station have dealt with this subject, the nitrogen of soils, so extensively that I will refrain from considering it in detail. For general farming purposes, nitrogen can be obtained at no great expense by the well known method of simply growing clover and other leguminous crops. In the case of the horticultural crops where concentrated forms of nitrogen are required, some nitrogenous manures are frequently

necessary. The rate at which a nitrogenous manure should be applied will, of course, depend entirely upon the soil and crop.

Another plant food element which frequently requires some attention on the part of the horticulturist is potassium, or potash, as it is more commonly called. This element has much to do with imparting vigor and stimulating plant growth; it is always found the most abundantly in plants in the active or growing parts. It takes an important part in the building up of the plant and the production of new cells. It is important in plant growth that the potash be assimilated in the early stages of plant life, otherwise restricted growth results, and a plant of low vitality is obtained. Potash alone will not accomplish these results, but it must be associated with nitrogen, phosphoric acid and other elements. The need of potash for our horticultural crops is, perhaps, not as imperative as the need of nitrogen, because, as a rule, our soils are more liberally supplied with potash than with nitrogen or phosporic acid; nevertheless, there are some soils in the state that could be benefited for horticultural purposes if some form of potash dressing were employed.

In addition to the nitrogen or potash, the only other element which crops may possibly require on ordinary soils is phosphorus in the form of phosphates. The amount of phosphorus in a fertilizer is usually referred to as its phosphoric acid content. The phosphates are associated with the nitrogenous compounds and stored up largely in the seeds of plants. In the production of seeds of the highest vigor and vitality, a good supply of phosphates is essential. Fruiting and seeding are stimulated by phosphate fertilizers. Not only is the seed, but also is the brilliancy of the flower influenced by different plant food elements, particularly phosphoric acid. As in the case of a nitrogenous or potash fertilizer, a phosphate fertilizer when used alone may fail to fulfill its mission unless it is properly combined and works in harmony with the other essential elements of plant food.

Definite rules for the combination of the essential elements of plant food can not be formulated because soils differ so widely in their composition, and then, too, crops differ materially as to their demands for plant food. For general horticultural purposes, medium or average dressings of commercial manures are preferable to heavy applications. In the case of well rotted manure, as high as thirty tons or more per acre may be safely used upon many crops, particularly corn, but in no case should more than 500 pounds of a commercial fertilizer be used for any crop, and in many cases less than half this amount is sufficient, unless, of course, experience

shows that a large application may be used. It should be remembered that in supplying plants with food, the same law holds true as in supplying animals with food. After the early stages of growth have been passed it is not possible for the food to be as valuable as if supplied in the early stages of growth. In the case of a growing pig, for example, if he is supplied with simply a ration of corn until he has passed the growing period it is not possible, by subsequent feeding, to build a large frame work of muscle and bone. So with plants, if the food is not supplied in the early stages of growth it is not possible by subsequent application of fertilizers to secure as large or as thrifty plants as if the food had been supplied at an earlier period.

The subject of plant food undoubtedly has an important part in producing new varieties of plants and also in the perpetuation of some desirable property. The subject of plant food is interesting not only to the farmer and horticulturist, but also to the floriculturist. Take, for instance, any plant of a leafy nature, the leaves of which are of a yellowish tinge and the plant in a generally unthrifty condition. If not more than half teaspoon of a mixture of nitrate of soda, sulphate of potash and acid phosphate of lime dissolved in half a gallon of water be fed to the plant a little at a time, for a few days, the influence of this plant food upon the foliage, vigor and general appearance of the plant will be apparent. If luxuriant foliage is desired the proportion of nitrate of soda should be increased. If flowers of greater brilliancy are sought then part of the nitrate should give way to more of the phosphate.

The feeding of plants is founded upon a rational basis; it is simply supplying that which nature is unable to furnish because of an impoverished condition of the soil. The feeding of plants, like the feeding of animals, is an exact science based upon the laws of nature. Many of these laws, however, are as yet not perfectly understood, but it is hoped that in the near future our knowledge in regard to the subject of plant food will be more extensive.

THE TALE OF THE RINGS.

HERMAN H. CHAPMAN, GRAND RAPIDS.

How a forest records its history in its tree trunks is to be revealed when the trees are felled.

Every tree has its life history securely locked up in its heart. Each year of its growth a thin ring of wood is formed next to the bark and adjoining it a corresponding layer of bark. As the tree swells and swells, the bark is forced outward and splits into wide fissures. Much of it falls off altogether, but each ring of wood remains a faithful record of the year in which it was formed. When the ax or saw of the woodman ends the life of the tree and brings its body crashing to the earth, this record is unrolled before us, and by it we can determine almost every incident in the life and growth of the tree.

Trees, as well as human beings, have their periods of struggle and hardship, their prosperous times, their terrible misfortunes and hair-breadths escapes, their injuries and recovery, and their complete submergence in a struggle in which the odds were too great for their feeble strength to cope with.

Here is a sturdy oak whose tale revealed is that of steady perseverance in the face of difficulties—a slow, gradual growth, never checked, never daunted, till the final goal is reached, and it stands supreme, literally monarch of all it surveys.

Here is a mighty spruce, which has a tale of perseverance, but of a different sort. The oak conquers by force of character, by its fighting qualities. The spruce succeeds by its ability to endure. It is like the patient Jew, frugal, living on what would be starvation to others, till when their day of strength is past, and sudden disaster overtakes them, it enters into its inheritance and prospers amazingly.

See the record of this spruce, fifty, sixty, seventy years, each year represented by a ring so small that it takes great care to distinguish them at all, and the whole seventy do not occupy the space of three inches at the heart of the tree. What a tale of hardship this sets forth. Other trees have pre-empted the light on which the existence of the tree depends. The poor spruce must be content with the twilight that filters through the branches of its enemies, the poplar, birch and pine. But it is content. It knows that the young poplars or pines spring up beside it in the shade, but they can not endure, but will quickly die. It knows that the time will come when old age or disease will weaken the poplars, or perhaps a heavy wind will lay them low, and the spruce, old in years, but insignificant in stature, will escape injury, and still young in vitality will soon spring

ahead in the race. Now see its rings—it has made as much growth in ten years as in the preceding seventy and soon becomes a large tree.

What does the stump of this old white pine teach us? Evidently something extraordinary has happened to it, for way in near the heart a black scar runs around the edge of one of the annual rings, for nearly one-fourth of its circumference, and outside of this the rings are no longer complete but have their edges turned in against the face of this scar. Each subsequent ring reaches further across it. By the time they have met in the center many years have elapsed and there is a deep fissure where the scar once existd. But the later rings have bridged the gap and, growing thicker in the depression soon fill up the circumference of the tree to its natural roundness, leaving no sign of the old wound. What happened to the tree? While it was still young, its mortal enemy, the forest fire, swept through the woods, destroying most of its companions and burning a large strip of the tender bark on its exposed side, so that the bark died and fell off. But being better protected than the others and having still three-fourths of its bark left uninjured, it soon recovered, and its stump reveals how successfully it strove to heal the wound and grow to maturity, to perpetuate its species.

But as it takes many swallows to make the summer so it takes many trees to make a forest—and the forest has almost as much individuality as the tree itself. Though each tree and each species struggle with each other for life and supremacy, yet, in a sense, they are helpful to each other and protect each other from their common enemies of the forest, the wind and the fire. Other enemies there are, such as insects and disease, and sometimes the forest suffers so severely that its whole aspect is changed, and new species come in and replace the old. Much of this history the rings will reveal to us, as is the case in some of the following actual examples from studies recently made in the pine forests of northern Minnesota.

In one locality where rather small Norway pine stood very close together, making a thick stand, it was found that almost without exception the trees were of the same age—138 years. No matter how large or how tender the tree it was just as old as its neighbor. The rings on all these trees were very large at the heart, but as fifty or sixty years went by, they got narrower and narrower, until some of the smaller trees seemed hardly to grow at all. The reason was plain—there were too many trees—and as none would give up the struggle, all suffered alike.

But they were not the only sufferers. Here and there we see a slender, struggling white pine, making a vain attempt to capture

its share of sun and rain. Count reveals that these white pines are also all of the same age, but unfortunately, only 126 years old. The Norways had twelve years the start of them, and the delay was fatal.

How did it happen that these trees came in so thickly and all the same year? Perhaps further study will help us to find out. So we go to another cutting, over a mile from the first. Here we find many trees, about the size of those we have left, and counting the rings, we find them to be of the same age, 138 years. But here there is something more. In a secluded nook stands a group of immense white and Norway pine trees, perhaps a dozen. These prove to be very old, but remarkably enough, also of even age, each stump showing 315 rings. Where is the rest of this patriarchal forest? Close about the few remaining may be seen the forms of many more, stretched upon the ground and slowly decaying. These have evidently been blown down, possibly after being killed by fire. Their fate gives us the clue to the disappearance of the others. It is plain that some time before 1763, a great disaster overtook the pine forest in this place. Most of it was wiped out of existence, either by fire or wind. But here and there a clump remains and from them in a favorable seed year came the seed which started the new and thriving crop of Norway pine.

To find out if possible whether this conflagration or blow down was more than local, we go to a cutting some ten miles from our first, and here again the oldest and largest of the stand, which is all rather small, prove to be 138 years old. Whatever the cause then it must have operated over a large area, but this is not a thick stand —in fact there the many gaps, and much of the timber is limby and knotty, a sure sign that it has not been grown very close together, and soon we find that many, in fact, most of the trees are but 101 years old, there being two distinct age classes.

How did this come about? Let us look at the older trees. Here upon one of them is a fire scar, made when the tree was 18 years of age. Upon another we find a similar scar, made in the same year. And on close examination we can hardly find one of the older trees free from the marks of this fire. How plain it is, that this fire, occurring just 120 years ago, or in the year 1781, when the young forest was 18 years of age, killed nearly all the young pine and gave the forest a blow from which in this place at least, it never fully recovered. But it did the best it could, for the age of the second class of trees, 101 years, shows that the young survivors of the fire grew rapidly until at the age of 38 years they were enabled to produce a crop of seeds, or possibly the old trees from which the

first ones came were still living and seeded down the ground a second time, so that a fairly good stand of trees was finally produced.

These studies lead us to infer that pines reproduce themselves as forests, generally under exceptional or unusual circumstances, and that that is their natural way of maintaining themselves as species. The young white and Norway pine, especially the latter, cannot endure much shade when small, and could not possibly grow up as a thick forest under their own shade or the shade of other trees—yet we nearly always find them in dense groves. The rings tell us the secret. In the long period of 200 to 300 years during which the pines live, the "accident" of fire or wind becomes a certainty—and when a strip of forest is laid low or burned up, the neighboring trees stand ready to scatter the seed far and wide in the wind, and the new growth springs up and flourishes.

This is nature's method. But nature's methods are so perfectly harmonized that but little is needed to throw them out of balance. Nature clears in strips and dashes seed there, and fires are rare and far apart. Man clears over wide areas and fires of his origin sweep repeatedly over his slashings. The young pine spring up even after the second and third fires, but by perseverence the fires finally destroy them all, and what nature intended to be the young pine forest becomes a barren wilderness.

PROPAGATING NEW VARIETIES OF TREE FRUITS FROM SEED.

C. L. WATROUS, DES MOINES, IOWA.

(A talk.)

I have listened with a great deal of interest to what Mr. Patten has said, and I am not disposed to take issue with anything he has said, because we in Iowa recognize the fact that he understands more about these things than any one of us or all of us put together. If I could say anything here that I thought would be really useful it would be to preach a sort of crusade, as Peter the Hermit did, to Mr. Patten, Mr. Burbank, Mr. Morrill, who has done so much for crabs, and Mr. Williams, who has done so much for plums, who have all started on this fundamental course and brought together different strains of fruit out of which is to come the most promising varieties. What I want to preach is that the work should be taken up by all of us common people, by the pomologists, by the fruit growers generally, and my talk will be directed along that line. At the root of this, it seems to me, is the cause of our condition here in the northwest.

What I want to say will apply to this inland upper Mississippi

valley. It is not for the sea coast of the United States. In England and France great honors have been heaped upon men, and very justly, who have brought plants from the far corners of the globe, and I believe that work is of great importance to any country situated by the sea. All over the globe the sea is a great equalizer in that the conditions are somewhat alike. But when you go away from the sea, one or two thousand miles inland to a great valley or a great plain, there you have an entirely different thing, and the honors are to be for those who work, as I believe, with growing seedlings in that region where they are to be. I have little confidence in the doctrine that we are to get any great good by using Russian or breeds from any other country. I have, however, a great deal of confidence in growing a great many seedlings by bringing together the best fruits we have already here. Now how shall we do that? We may buy or otherwise procure from the scientific men their crosses that they have started; our experiment stations may do that. Then let those scions be put into the hands of every man who has an orchard, and let him graft them in the top of a bearing tree, and let a committee from your society, of your wisest men, give advice where they shall be grafted, and when the graft is in fruiting condition get a quantity of mosquito netting and sack up that graft in the branches of the tree where they have placed it and grow seedlings from the seed so produced. You want to protect it by mosquito netting on the graft alone. That is the work that should be done by every one of us common people who are simply fruit growers and not scientists at all. Let them blaze the way, and we can work after them. Instead of having a few crosses, such as any one man can make, we can have a vast number of them. Then the seeds produced in this way may be sent to your central experiment station or to your university, if you have a good man there, or to some commercial grower of seedlings who is apt in the management and growth of seedlings, and let them be grown.

I understand Mr. Burbank's triumphs are not from the crosses he makes by hand, but after he has made carefully all these crosses, as Mr. Patten has told us about, then hundreds of thousands of other crosses are made and seedlings are grown, using mosquito netting sacks, and in that way he gets a great number of seedlings, and out of that great number some of them will contain the qualities of hardiness, healthfulness and long keeping that he desires.

I spent a day on the place of Mr. Theodore Williams, in Nebraska, this summer, and was very much impressed by what he did there and what I saw and with what he told us— that is, Prof. Craig

and myself. Among other things he told us his plan of getting earlier fruit. He says if you want to get earlier fruiting you should grow seedlings, as many as you please, of the first fruit that ripens. If a plum has been stung by a curculio, that is, if it ripens prematurely, and the pit is good, get it and plant it. If you find down in the center of your apple tree, long after the crop has been gathered, an apple that was abnormal in ripening, that hung on long after the others were gone, gather the seeds and plant them, and you are liable to increase the length of the season. Every man who grows plums for market usually has to sell his plums when everybody else has plums to sell, but if he could market his plums when there were none in the market he could get a better price for them. I know of an extensive fruit grower in central Iowa who says that is the only way he makes money. He visits his neighbors, reads newspapers but does not try to market plums, but when his neighbors' plums are gone then he markets his. The same is true of cherries and all other fruits. The doctrine in which Mr. Williams has confidence more than anything else is this: If you expect to get good results from those seedlings which you plant, gather the seeds from the tree that, to use his own words, "is comfortable, that enjoys life in good soil, is sound and healthy, with the soil properly cultivated and enriched, from a tree that is having the best possible time in life apparently." From seeds of such a tree he gets his best results, and he believes that a tree responds to such things exactly the same as an animal would. We all know how careful breeders are of their animals, to see that they are sound and healthy, not exposed to any bad influences, not abused, and his doctrine is that trees should be just as tenderly cared for and looked after as are animals if you expect to breed from them and expect to get the best results.

I believe I have taken all the time I ought, but if I could preach a crusade to every horticultural society in this great central valley, and to the fruit growers generally, it would be that we can grow seedlings with these few rules in view which will meet the demands for fruit adapted to this great Mississippi valley.

VARIETIES OF CRABS FOR MINNESOTA.

DITUS DAY, FARMINGTON.

I took up Webster's Unabridged Dictionary and found out the meaning of "crab." First, a crustacea, the body being covered by a crust-like shell. It has ten legs, the front pair of which terminates with claws. Second, a wild apple on the tree producing it; so named from its sour, rough taste. Of the crabs there are several varieties,

the principal of which are the Pyrus baccata (Siberian) and Pyrus malus, our native crab, common in America and Europe. The latter is the origin of our common luscious apples of today, their characteristics being changed by cultivation, selection and care.

Of the real crabs I do not think I can recommend any of them for cultivation in Minnesota, for their small size and sour crabbed taste. So I will turn my attention to their near relatives, to what we call hybrids. Of these there are many, we may say hundreds of them. But I will mention only a few of them that have been profitable to me or my friends.

The first I will mention is the Montreal Wax. The tree is a strong, thrifty grower, with spreading top; does not blight; very prolific each alternate year; fruit about the size of Transcendent; bright red in color when ripe and is very salable in the market. I have two trees, and they have brought me more money than any other two trees I have on my place. They produce biennially about forty bushels, and at least three-fourths are marketable.

The Early Strawberry I would recommend setting out a few trees of for one's own use. It is good when first ripe but soon becomes mealy and soon decays. The tree is a handsome grower and very prolific; blights some; fruit about size of Transcendent.

The Florence is a first rate crab apple. The trees blight but little and bear very prolifically, especially each alternate year, of very beautiful red fruit that sells well in the market. I call it one of the best.

The Martha is also number one, but with me it is not as prolific as the Florence. The fruit is larger and very smooth and beautiful, but it does not stand our late spring frosts as well as Florence. My trees were full of bloom last spring, but I had no fruit.

Brier Sweet is a hybrid that is a good cooker; is excellent for sweet pickles; a little larger than Transcendent; it bears well, is very prolific each alternate year; is not subject to blight; is a thrifty growing tree.

The Sweet Russet is another excellent hybrid, very sweet and good to eat out of hand. The tree is a thrifty, upright grower and nearly free from blight.

Orange crab, for home use, we think to be a valuable apple. It is, as its name indicates, of an orange color; does not sell well in the market on account of its color; but for home use, especially for canning, we call it No. 1, as it will retain its shape well after being cooked. My people pare them and then halve them and dig out the core, cook and can them. They show well in the cans. Some think

they are peaches, and they are quite as good, much better than some that are sold on the market in our cities.

In passing I would not forget that old stand-by, the Transcendent. True, it blights badly, yet it has produced more fruit than any other tree that we have in Minnesota, and I think we ought not wholly to discard it, as it is the farmer's fruit tree, and it is pretty sure to give him some fruit; besides, it gives him courage to plant more and better fruit.

Meader's Red Winter is a hybrid that keeps well into the winter; is about the size of the Transcendent; the tree blights a little; the fruit is good to eat out of hand; just suits the little ones and seems to satisfy them. It bears every year but is more prolific each alternate year.

Minnesota is a large, fair apple, so large that some have claimed that it is not a hybrid. It is a nice apple to eat; season late fall. The tree is quite free from blight and quite productive with age.

There are many others as good as I have named, but I have named only those with which I am acquainted. I have some seedlings that will equal them, but they are not on the market.

Mr. W. L. Taylor: What kind of trees did you plant in your windbreak?

Mr. Day: I set white willows; I planted a row clear around on the east and south sides, and I set maple on the south side. It makes a good and heavy windbreak.

Mr. A. D. Leach: Did you ever notice a difference in the blighting of the Transcendent whether they were on moderately high ground or low ground?

Mr. Day: I cannot answer that question. I have some Transcendent trees that bore very heavily this year, some that bore nearly forty bushels of apples on one tree. I have some trees set out nearly forty years ago and some are rotten nearly through.

Mr. Leach: I have two Transcendent trees that were set thirty-three years ago. They stand near the house on very high and dry ground, on clay soil. Those trees have never blighted during all that period of thirty-three years. Then I have some more trees that I set on ground a little lower and quite flat. Those trees are all going up, and they might as well go. Both lots are not over ten or twelve rods apart. Those that are blighted are on flat ground and those that are not blighted are on very high ground.

CULTURE OF AMERICAN GINSENG.

The subject of growing ginseng has recently received so much attention from the agricultural press of the country and from circulars and pamphlets sent broadcast throughout the country by dealers, that hundreds of people are being induced to try its culture.

Many of the articles are written by people who have no personal knowledge of the best way to grow it or of the profits to be derived thereby. Others are written by dealers who have seeds and plants to sell, and in both instances as a rule the information is second hand and unreliable. The most extravagant figures are given showing enormous yields produced on a given acreage and Monte Cristo fortunes to be made out of a paltry investment while one loafs in the back yard watching the gold dollars sprouting.

Certain dealers have sent out figures informing the public that $5 invested in their seeds and plants will show a value of $44,340.00 the fifteenth year.

A million dollar bed in twelve years from a $1,000 investment is advertised on another page. A value *which cannot be obtained* except perhaps in small quantities is placed on the seeds and young plants, and the ratio of increase and loss is given very accurately and more extravagantly *on paper*. Can any of these versatile writers please inform us how many turnips can be grown on a $5 investment in twelve years, the price the roots and seeds will bring each year and how rich a man will be at the end of that period? Certainly not, and information pretending to figure it out would be absolute nonsense.

An article on ginseng appeared in a western paper a short time ago and was extensively copied. Among other wild statements the writer said that seeds bring five cents each (another writer says there is unlimited demand at twenty-five cents each) and yearling roots twenty cents each; that the eighth year an acre should produce 3,120,000 seeds which sell at five cents each giving an annual income to the fortunate grower of $100,000.00 from the seeds alone. He further states: "Say that a full crop of seed from one acre is available for planting. That will be 3,120,000 seed. Allow for the loss and failure to generate or 1,120,000 seed. This will leave 2,000,000 seed that are practically sure to generate and create 2,000,000 roots. In eighteen months these roots will be ready for the market and can be sold direct to consumers, the present price being 20 cents each or a total of $400,000,000 from the ginseng crop in eighteen months. This crop of 2,000,000 roots would require a space of approximately forty acres. One acre should produce 52,000 roots, which at the

market price of 20 cents each, should, after eighteen months, bring a return of $10,400.00."

Could anything be more baldly ridiculous? Let us suppose that only 1,000 gardeners had the above success as to yield. This would mean over three billion seeds put on the market each year, which at five cents each would require $150,000,000 annually to pay for them, not to mention the value of the roots.

Suppose further that the ratio of increase both in yield of crops and number of growers continued the same for twenty-five years there would not be money enough in the world to buy a single year's crop. China, the source of demand for ginseng, would have used all their wealth in its purchase long before the period of twenty-five years had elapsed.

Notwithstanding these air castles there is an enormous profit in growing the plant, but it depends on the individual grower as in any other crop. The right conditions for its culture must be supplied, either naturally or artificially and intelligent cultivation given. There will probably always be a good demand for the root at high prices, and it is an article commanding cash at all times. These conditions for growing are readily found in nearly all the states of the Union or can be produced at reasonable cost of labor and material. They may be stated in a few words: A rich, deep, well-drained, and moist soil, containing abundant decayed vegetable matter and not too heavy or clayey. Humus or vegetable mold, obtained by using decayed forest leaves is extremely beneficial, as is also thoroughly rotted compost. Shade sufficient to keep off the direct rays of the sun is almost necessary, particularly in sections where the heat is excessive. Add to this careful cultivation, and you have the secret, if there really be any, of growing ginseng successfully. Lath covers are perhaps the best artificial shade, and apple trees have been found good to keep the ground protected from the sun. At maturity the roots must be carefully and properly prepared for market, and the extra care taken to produce a fine article, clean, well graded and perfectly dry is more than repaid by the much higher price such roots will bring.—H. P. K.

Secretary's Corner.

THE PROGRAM OF THE ANNUAL MEETING—Will be issued November 15th. Will you be with us on that occasion? If not it will be a mutual loss. Come!

FILLS A VACANCY ON THE STATE FORESTRY BOARD.—Gov. Van Sant has appointed S. M. Owen, of Minneapolis, to the state forestry board to succeed the late Judson N. Cross, of Minneapolis.

HORTICULTURAL MEETINGS OF OTHER STATES.—The Iowa State Society meets at Des Moines, December 10-13; the Northeastern Iowa Society meets at Rockford, Ia., December 17-18. The Wisconsin Society meets in February.

MINNESOTA FRUIT AT THE PAN-AMERICAN EXPOSITION.—In a letter from Thos. Redpath, who has been in charge of the fruit exhibit there from this state during the month of October, he says: "I hear nothing but praises for Minnesota fruit. Of course the display is ahead of anything here. Everybody says so."

INTERNATIONAL SOCIETY OF ARBORICULTURE.—An association with the above title has been lately organized, and John P. Brown, of Connorsville, Ind., is its secretary. It is issuing circulars, bulletins, etc., pertaining to the work of forestry in the land, and is doing its share in the educational movement in this direction now going forward.

A REMOVAL.—John C. Walker, of Rose Creek, in sending in the renewal of membership for 1902, announces his early removal to Chico, Cal., for reasons of health. Mr. Walker has been for many years one of the most faithful members of our organization, and we shall miss him much. We are sorry to have him go, but expect to hear from him again.

DELEGATES TO THE ANNUAL MEETING.—Dr. F. M. Powell, of Glenwood, Ia., will represent the Iowa State Horticultural Society at our annual gathering, and Sec'y C. H. True, the Northeastern Iowa Society. At the moment of going to press other appointments are not known, but a representation from all the other societies with whom we touch elbows is assured.

APPLES IN NORMAN COUNTY.—Rev. O. A. Th. Solem, of Halstad, Minn., made an interesting exhibit of apples at the late county fair held at Ada, Minn., including a number of varieties of crabs and specimens of the University and Hibernal apples. As this county lies well north and out of the Minnesota apple belt, in the Red River Valley, such a display attracted much attention.

PLUMS AND PLUM CULTURE.—The most interesting and, we believe, most valuable new book lately added to the library is one with the above title, just from the press, by Prof. F. A Waugh, of Burlington, Vt. Prof. Waugh is the horticulturist of the Vermont State Experiment Station, and its being written as the result of an experience in so northerly a latitude adds much to its value for this region.

ARE YOU COMING TO THE ANNUAL MEETING?—Which meets in Minneapolis, December 3-6? The meeting will be held at the Plymouth Congregational Church same as last year. The attendance is sure to be large, and you cannot afford to stay away. Reduced railroad and hotel rates will make it an economical time to visit the city, and the meeting will be found worth much more than it costs. Come!

CONTENTS OF THE PROGRAM.—The program of the annual meeting will include as usual programs by the State Forestry Association, the Minnesota Beekeepers' Association and the Woman's Auxiliary. The annual banquet and illustrated stereopticon lectures two other evenings during the session will add to the interest. Come and get acquainted with the horticulturists of the northwest. It will be mutually helpful.

VISITORS AT THE ANNUAL MEETING.—Prospective visitors from adjoining states at our forthcoming meeting, who have expressed an intention to be with us are, in part, Sec'y Wesley Greene, of the Iowa Society; Prof. H. C. Price, horticulturist of the Iowa Agricultural College; Prof. N. E. Hansen, of the South Dakota Agricultural College; Prof. C. B. Waldron, of the North Dakota Agricultural College; A. J. Philips, of West Salem, Wis., and J. L. Herbst, Secretary of the Wisconsin Society. A number of other prominent horticulturists in the northwest are confidently expected.

MINNESOTA FRUIT AT BUFFALO.—The following extract from a letter from Hon. H. E. Van Deman, pomologist at the Pan-American Exposition, will be of interest to our readers.

"Your state has been doing fairly well here in the way of fruit exhibits, especially since they moved the big castle, which you no doubt know all about, and set it up here in our building. It is, of course, simply a matter of ornament, but they have quite a variety of fruit that gives it some pomological value. They have not devoted much money to the horticultural display and not nearly so much as I think they should have given to it."

PREMIUMS OFFERED ON SEEDLING APPLES.

A special effort is being made to get out a large show of valuable keeping seedling apples at the coming annual meeting of this society, and with this end in view unusual premiums are being offered, as follows:

"*EARLY WINTER VARIETY.*—The fruit shown must have been grown by the owner of the original tree and not kept in cold storage. A specimen of wood three years old (at least six inches long) taken from the tree bearing the apples shown, and a concise history and description of the tree and its fruit, must accompany each entry.

"Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator. Successful competitors who are not members of the society will be made so for the current year by deducting one dollar, the annual fee, from the amount of the award.

"Premium will be divided pro rata among all the entries commended by the judges, according to the comparative merit of each as a commercial fruit. Premium, $20.00."

"*LATE WINTER VARIETY.*—Same conditions as for early winter variety, except that if found necessary the fruit shown may be retained and final decision reserved till later in the winter. Premium, $40.00."

For other premiums see premium list to be found with the program.

AGRICULTURAL HALL, MINNESOTA STATE FAIR. SIZE 240 X 160 FEET. VIEW OF NORTH END, DEVOTED TO HORTICULTURE.

THE MINNESOTA
HORTICULTURIST.

VOL. 29. DECEMBER, 1901. No. 12.

IMPROVING TREES AND PLANTS.

W. W. PENDERGAST, HUTCHINSON.

(Presented before Wisconsin State Hort. Society.)

The Chinese worship their ancestors and so plod along their weary, unprogressive ways in the tracks which their grandfathers left behind them. As a result, in the race of nations they are distanced. The ones who come out ahead are they who, setting their goal far ahead, call into requisition brain and muscle and a determined will to reach it. It is for us to take our choice of the two ways. Inertia whispers "Take it easy; follow the beaten road;" progress cries "Advance, push on to sublimer heights, the procession is forming, the music is inspiring; fall into line, not at the tail end but get as close to the band wagon as you can."

The great secret of success in life is to do some useful thing well, a little better, if possible, than any one else can do it or, at least, does do it. We are interested in fruits, trees and flowers, three things which, after a few absolute necessities, have done more for man than all things else combined. Bread and clothing make life possible; appreciation and love of the beautiful make that life worth living. We, therefore, devote part of our time to supplying our physical wants and another portion to the cultivation of our moral and aesthetic natures along the lines of horticulture. As has been intimated, our work should be marked by its superior excellence. To be satisfactory to ourselves, it should be done better than the best which others are doing; if not we are falling short of our highest duty, which means failing to grasp the highest enjoyment. What shall we set ourselves about then?

CULTIVATION OF TREES.

The most valuable of the shade and ornamental trees which are adapted to the conditions of the locality where they are wanted should be wisely determined, and such trees should be artistically placed around the home, the field, the garden, the cemetery or by the road side, relieving from the desolation and sometimes savageness,

even, of the natural parching heats of summer and winter's cold tempests, all who come within their charmed precinct. Such selection of trees and such disposal of them will call for the wisest planning, the best judgment, the highest skill. Tree planting can be done in a hap-hazard, slipshod way, by Tom, Dick and Harry, but did we not set out with the full determination to do a little better than the "ignoble vulgar," whom the poet Horace so heartily despised? Were we not, if possible, to surpass the very elect? Then we must educate ourselves by persistent, concentrated thought based on demonstrated facts, which is, in fact, the only education of any value.

The various fruit trees must be increased in hardiness of root, stem and bud, in size and beauty, in flavor and keeping qualities of the fruits. Desirable exotics should be sought out, introduced and made to feel themselves at home with us, but above all our native kinds, the old friends we have loved from childhood, and, would it be too much to say, "who have reciprocated that affection," should be carefully cultivated, their faces made more charming, their fragrance more delightful, their season prolonged, their hardiness, where they are not already iron clad, increased.

How shall these desirable improvements be brought about? How does nature, unaided by man, manage to effect a change for the better in the growth and vigor of her plants? Supposing a neglected part of the garden is filled with mustard seed, a hundred or more to the square foot. All of these cannot live, grow to their normal height, bear seeds and thus answer their life's great end. Watch carefully day by day, and you will see that the strongest and most vigorous crowd out and overpower the weaker ones, which are doomed thereby to death. Those best fitted to their surroundings, as shown by their superior vitality and consequent thriftiness, live to reproduce their kind; and this process, continued year after year, gives rise to a superior strain, as far as health, hardiness and vigor are concerned, of the weed which we are considering. The fact that no two living organisms are exactly alike is of the utmost importance to the progressive horticulturist, whose chief desire is to deduce principles from established facts and from them work out some practical good. From the slightly differing plants of a kind, which promise a suitable reward for his zeal, patience and skill, he wishes to evolve a new and more valuable variety. He will select the ones which come the nearest to his ideal and then proceed to widen the gap between these and their fellows, always keeping in view the particular excellence he had in mind at the beginning.

His only course will be to follow out his original plan by continually propagating from the plants which possess in the highest degree the qualities at which he is aiming. There must be no wavering, not even a shadow of turning. He must be

"Like to the Pontic sea,
Whose icy current and compulsive force,
Ne'er knows retiring ebb but keeps right on
To the Propontic and the Hellespont."

The dahlia, the potato and the Wealthy apple have been developed in this way. The dahlia came from a little inferior single flower, found on the plateaus of Mexico, growing wild. The potato was a native weed of Peru, fighting its crowding neighbors for a chance to live, and with its little tuber, rivaling a minnie bullet in size and disgustingly sickish in flavor, gave little promise of the important part it was to play in the world's economy. The apple has come down to us from the wild crab, which even an ostrich *would* not eat and *could* not digest.

In these three worthless products of the vegetable kingdom man with a purpose and an unlimited stock of perseverence saw his opportunity, and in the process of time—I almost said "in the fullness of time," but the "fullness has not arrived—there came from the Mexican weed one of the most magnificent flowers with which the great world of today is acquainted, from Peru's insipid specimen one of the half-dozen great agricultural staples which civilization would think it an irreparable loss to cast aside. From that wild crab has been developed the king of all fruits of the earth.

What has been done can be done again. If the wild crab can be metamorphosed over into a Wealthy apple, it does not admit of a doubt that the best apples of the northwest today can be further changed to meet the conditions more fully and to adapt them more completely to their environments, at the same time improving their flavor and their keeping qualities. To do this best in the least time the course to be pursued must be planned with care and judgment. It might be well to select at first, say, eight of the best varieties which are now grown, each one of which excels decidedly in some one quality. Let one be an iron-clad, one very highly flavored, one a beauty to look at, one a good grower, one a great bearer, one a long keeper, one fine-grained, juicy and free from mealiness, while the last might represent a spreading habit, long life and all that is desirable in the tree itself. All the chosen varieties should possess as many good qualities as possible, but be particularly excellent in the one named. When the selection is made by a well selected committee appointed for the purpose, and the plan of operations adopted, let the experi-

ment stations, amateurs and practical horticulturists and all others who wish to take part, begin by crossing each kind with each of the others. This will give twenty-eight combinations, the fruits of each having a different pedigree. As soon as these bloom let the propagator cross two varieties of the twenty-eight, then two more, till he gets to the last. This would reduce the number from which selection would be made to fourteen. A repetition of this operation would give but seven to propagate from. Continuing along the same line the next time we should have three crosses and one odd tree to cross with the best one already found.

Before reaching this point, which would require forty years or thereabouts, we should obtain some very good apples, and if long keeping has been made a specialty in all the selections, there will, doubtless, be a few good winter apples. Yet it must not be forgotten that we are building for posterity and enjoying the work.

What are the advantages of this method? The great trouble with all seedlings of fruits which, by cultivation, have been raised far above the normal level, is to "breed back" towards the normal condition, getting their distinguishing characteristic from some ancestor or ancestors that stood lower in the scale than the specimen which bore the seed that was planted. Plant a Wealthy seed and try to forecast the future by "guessing" what the fruit will be. The parents will in some way stamp their mark upon the offspring, but the ancestors will have their influence too, and the four of the second degree will exert as much as the parents themselves. Going back one degree further we find eight ancestors which collectively have as much potentiality as the four in the second degree, each one standing one chance in eight of marking the new seedling with one of its characters. At the tenth remove we find over a thousand ancestors back of this degree, and if 999 of them were summer apples and one a long keeper, "breeding back" ten generations would have one chance in a thousand to be a winter apple and then it would probably be valueless, because so many of its ancestors were acrid, bitter and of no account. In the plan proposed in this paper one more cross would result in a single pair or set of parents, and a seedling from them could not possibly have more than eight ancestors in the sixth generation, all of which would be of a very high order, while one raised in the usual way would have sixty-four. Proceeding four degrees further by inbreeding from these two and their offspring we shall reach a place where tracing the pedigree of an apple back ten generations we still find but eight individuals of this degree as against 1,024 of the seedlings had been produced in a haphazard way, or by simply propagating from the best without adopting

any method. In the way proposed, a seedling cannot revert to any one of all its ancestors to the tenth degree without striking a good apple, for it is in the scheme that not only shall the eight original trees be good, but also that not one of all the seedlings shall be propagated unless it possesses some great excellency, and no defect so serious as to completely unfit it for the trying situation in which the coming apple is to be placed, because each seedling is liable to revert to any one or more of its ancestors for many generations back, perhaps to the original wild crab; if so it has taken such a number of distinctive marks and character from other predecessors scattered along the whole line of descent that those of the crab are so mixed up and blended with the others they are not distinguishable. If one particular character is constantly bred for, that type will soon become fixed. Suppose one character to be lateness in ripening. Now to this add hardiness, and after a while we shall have a hardy winter apple with the same fixity of type, and so on through the list. This principle incorporated in the plan I have outlined, and carried far enough will, I think, surely give us the apple we are seeking, and when one comes many more will bear it company.

PERSONAL REMINISCENCES OF A FARMER'S FRUIT GARDEN.

MISS LENA M. FREEMAN, AUSTIN.

(Read before S. Minn. Hort. Society.)

The earliest apple to mature in our orchard is the Tetofsky. This variety, although a light bearer and observing the alternate fruiting years only too strongly, still must be the stand by for the earliest apple for use, especially for eating out of hand. They are not good keepers, but they do not often have the chance to prove or disprove this assertion, for they disappear too rapidly. These are the apples that the boys covet, and we have often gathered ours before they were at their best, else we would have none for ourselves. The tree that bears the nicest apples stands only a few feet back from the road fence. One warm evening, a few years ago, soon after all of the family had retired, my mother, who was still awake, heard a wire sing; then, shortly, the soft thud of falling apples; immediately, imitating a masculine voice, she called out, "we are watching for you," and with a yell of defiance, away ran the boys. Quickly lighting a lantern we soon had those apples safe in the house. I pity the boys obliged to rob a neighbor's orchard to satisfy the natural craving for fruit. Too bad that they have none at their own homes!

The Duchess of Oldenburg yields us the most returns, although

we never sell any. We use the early windfalls for sauce, even before they are of sufficient size to pay to pare. We cut off the sides and after cooking pass them through a colander to remove the skins, then season with sugar and cinnamon, or some essence to cancel the bitter taste caused by immaturity and cooking with paring. These early windfalls make fine jelly, especially if you use the cores (if not wormy or decayed) left from making sauce, as the seeds give a pleasing nutty flavor. A richer color may be obtained by using some fruit coloring extract, or, as I often do, by using only one-half the customary amount of sugar and boiling the juice and sugar until it is jellied. Be sure to add the sugar to the juice directly when it is put over to boil, or the jelly will be a dark, muddy color instead of a rich red.

We dry all of the matured Duchess apples for winter use, having one year dried ten barrels this way. We use an apple parer but prefer to do our own slicing. We slice from the sides of the apple, and dry on clean white cloths, usually old, worn out sheets stretched on boards, placed where the sunshine will strike them all day long, and cover with mosquito netting to exclude the flies. If one is very short of apples, the bits of apple adhering to the cores, can be used for sauce, but I do not think that this pays for the time spent, as you can remove nearly all of the flesh from the core, by curving the slices removed. If you wish more jelly or apple butter, these cores, if not wormy, will do nicely.

We have enough Wealthy apples to supply the family from the time that the Duchess are gone, until Wealthy has to end its days. Sometimes after a severe wind storm, we have tried to dry the Wealthy windfalls, but have never succeeded to any extent because of the kind of apple or prevailing cooler weather, but mainly, I think, from lack of sufficient sunshine, resultant from shorter days. I do not like apples dried around a cook stove or the store evaporated apples. Of course the Wealthys are nice canned, but I never had good success in canning the Duchess.

Three varieties of crab apples furnish us with sweet pickles; we also use them for sauce and jelly. In making sauce from these crab apples, we always cook without paring, removing the skins and cores, if preferred, after cooking. We have just one Malinda tree, but could easily use the fruit from several more, as no other apple so well satisfies our sense of taste for winter sauce, if cooked correctly. This one tree gave us six barrels of fruit two years. A laughable incident once occurred in this little orchard. One morning we noticed that during the night several posts of the fence around the orchard had been broken down, apples were scattered everywhere,

and although our trees had not been disturbed evidently something had happened during the night. Long afterwards we learned the story of that night's frolic. Some mischievous boys had planned a raid upon our orchard as well as others in the immediate neighborhood. Their plans were overheard, and two young men entered our orchard and voluntarily went on guard. They soon fell asleep, and were rudely awakened by the raiding boys who nearly stepped on them. Immediately they gave chase, but forgot the wire fence, and soon men, boys, barbed wire and fence posts were hopelessly mixed up, resulting in a big scare and loss of apples to the boys, and tattered and torn pantaloons for the young men.

Our garden is quite a distance from the house and barns, in order to remove it beyond the depredations of the chickens. Usually there is a narrow strip of grain or sweet corn between the house and garden, thus to more effectually bewilder these marauders. The garden is laid out in long rows for horse cultivation. My strawberries occupy one part of the plot; aim to plant some four or more rows all the way through each separate, yearly planting. Try to plant in one row those vegetables that require cultivating about the same length of time, but also to have several parts of rows abreast each other, like corn, so that the pollen may have a better chance to produce more perfect results. Sow a few radish seeds with all slow, germinating seeds, so that the rows may be cultivated and hoed from the first, thus saving as much weeding as possible; but the radishes must be removed before they become a hindrance to the growth of the other crops. Usually sow more seeds than needed so that if, during a busy time, the weeds get the start, then that part of the garden can be cultivated up, and some other crop take its place. This plan works well, if that part of the garden escapes my father's eye; otherwise, I may get a gentle reminder of the necessity of never allowing the weed to seed or, better still, to be seen. I sow all of my flower seeds in the garden with the vegetables. Then, when they become quite strong plants, transplant some around the house and in the yard; but even in this way, the chickens bother much. So aim to produce cut flowers in the garden, where the soil is rich and mellow, and under thorough cultivation every year, and no grass allowed to sap the strength from the soil. There are a few things which I have learned from practical experience, and after noting what occurs to my memory I will not longer tax your patience. Sow plenty of seed, both vegetable and flower; the plants can easily be thinned, saving the more vigorous ones, as all seeds at their best are apt to prove a delusion and a snare. Of course you

will have winter onions, which are ready to use almost as soon as the snow disappears in the spring. In the same plat with these onions, leave a row of lettuce and radish to self-sow, and thus furnish a tid-bit in the early spring of these tender, crisp vegetables.

Mulch the strawberry bed after the ground freezes in the early winter, with a layer of corn-stalks and also a thin layer of straw on top of the stalks. Leave the mulch on the bed until about the twentieth of May, as farmers have no time to protect the tender blossoms from an early frost, and consequently get poor berries or complete disaster. Rake the peas and beans before and after coming out of the ground many times, and thus save baking of the soil and much future weeding. Leave others who have more time than you to sow quantities of onion seed, carrots, parsnips, etc. A short row will take all the time that you can spare from other duties. Remember, time is money on the farm. Cabbage, tomatoes and musk-melons are very easily raised, so, I suppose, are watermelons, but luck in that direction never came my way.

I thank you for your patience in listening to this reminiscent article, and trust that you, each and all, as well as we, have at least a small orchard and garden, in which you profitably spend many a pleasant hour.

HOW TO IMPROVE AND BEAUTIFY THE FARM YARD.

MRS. A. W. MASSEE, ALBERT LEA.

(Read before S. Minn. Hort. Society.)

I mention first, as the most important of the means used to beautify our homes, the grass plot. This should surround the house for the sake of cleanliness and neatness. How many farm houses we see where the back yard is entirely devoid of grass, sometimes given up to pigs—a veritable mudhole, through which the whole family stalk directly into the kitchen, adding much to the work and worry of the overburdened housewife. That place I would take in hand first, and if I could not have some grass I would have some gravel, and plank walks. I would banish the pigs to their proper place and *keep* them there if possible. When on the farm I have several times been persistently labored with to convince me that it was an *utter impossibility* to *always* keep pigs, especially *little* ones, in their proper place; though I might be convinced, it did not restore my pet pansy bed to its normal condition. O, I know all about it! I have been there and the pigs also.

With some labor and a little care the back yard can be got into

grass, and that with walks will add much to the comfort of the family and the attractiveness of the place.

A clump of evergreens or a few common, hardy, easily grown shrubs will add more to the appearance of the place, and when once properly planted and cared for a short time will then take care of themselves and go on growing in beauty from year to year.

I would wish to have a farm house at least one hundred feet from the highway, with grass in front and on either side and at the back, if possible. To keep the grass in order will require some care. To use a lawn mower to advantage will require the ground to be smoother than you will find it in ordinary farm yards and take more time than most farmers wish to devote to their grass plots. But, the grass can be kept to look very well indeed and insure cleanliness around the house by mowing it with a scythe at intervals. Blue grass I consider the best for grass plots. It makes the best permanent sward and if mown with a scythe every time before the seed ripens can be kept within bounds; otherwise it will take possession of the surrounding territory. For lawns where lawn mowers are used, it is the very best.

Having the grass plot, just give your wife a little money with which to buy a few hardy shrubs for her yard and a few evergreens of the dwarf kinds to gladden the eye in winter. Plant these shrubs and evergreens promiscuously, in no set form, but preferably at the sides of the yard. Lilacs, both purple and white, spirea, syringa and snowball are hardy, spring-flowering shrubs and make a good variety for an ordinary sized yard. In one corner I would have a clump of, say, three, set at least six feet apart, hardy hydrangea paniculata—or one on the sunny side of the house. They are as hardy as a lilac and very beautiful blooming in the fall, when other shrubs are out of bloom. They are not expensive, are sure to grow and do well; but to have them do better you should dig a large, deep hole and fill in with rich earth and manure when planting at first; the next spring, and every spring after, cut back every branch fully one-half and cut out all weak branches so that the bush looks as though nearly ruined; then fork in around it all the manure your conscience will allow, and then a little more, and then mulch quite heavily with some coarse manure. It will use it all. If near the house, perhaps the wife will turn part of the wash water on it each week through the summer; if so, in August it will surprise you with size and beauty of its blossoms. It is a good shrub to have in the back yard in a sunny place, where it is ever ready to appropriate all the slops and refuse water it can get.

It is very nice to have a border, say six feet wide, on one side of the grass plot for perennials, such as larkspur, phlox, hollyhocks, rudbeckia and some hardy lilies, putting the taller growing plants at the back of the border and small ones in front—and by all means have some of the old-fashioned sweet pinks. The double ones must be got from roots, which are now quite scarce. Some florists have them and sell them reasonably. From a small root you can soon get a large clump. I have given hundreds of roots away and expect to do so as long as I live. If you cannot get a root try seed.

Several years ago I for three cents got a paper of dianthus plumarius (Pheasants Eye pink). I sowed them in a box in May; when the plants were three or four inches high I transplanted them to a bed in the garden, setting about fifteen inches apart. Before winter that bed was a complete mat of green. I think I had better have set them eighteen inches apart. The next May that bed bloomed, and every May since, and I am proud of it. The bed is ten feet across, and yet I gave away more plants than I used. Most of the plants gave single flowers, but all delicate and pretty and as fragrant as a carnation. Some plants gave small, but very double, handsome flowers. In May and June that bed is covered with hundreds of flowers that scent the whole yard, and delight not only myself but the passer by. I pick quantities of flowers from it for myself and others, and all for three cents and a little labor the first year. It has taken care of itself since. Do you think there are any weeds in that bed? No, indeed, the pinks have taken possession of every inch of ground, and my neighbors to whom I gave plants have had the same happy experience as myself.

Now, if you wish to particularly please your wife and give the whole family delight, yourself included, help your wife to a tulip bed. These must be planted in October. For $1.25 or $1.50 you can buy one hundred mixed tulip bulbs. These will plant a round bed five feet across. A tulip bed shows to the best advantage in the lawn. Take out the sod and dig up the ground to the depth of twelve inches or more. Fill up with good garden soil well pulverized,—no manure unless well rotted and thoroughly mixed with the under soil, as it must not come in contact with the bulb to rot it. When the bed is filled within three inches of the top place your tulips at regular distances apart, and cover, heaping the soil over them so that the bed when settled will be slightly higher than the surrounding grass; round it up so the water will run off. Just before winter sets in cover the bed with some coarse litter or trash, and the tulips are ready for business. In the spring remove only a part of the covering quite early, then watch, and as soon as the leaves

have pushed about one inch through the soil remove the rest, unless the weather is very frosty, when it can be left a little longer. A freeze will not injure the plant in the least, only if warm weather occurs early in the spring it might force the blossoms so early that they are liable to be caught by a later freeze, which mars their beauty. They soon come into bloom, and you will wonder how you ever did without them. Keep the weeds and grass out of the bed, stirring the soil occasionally to prevent baking. After the tulips have died down or nearly so, you can plant some low growing annual, like sweet alyssum, in the bed and that will help to keep the weeds out. In the fall, cover the bed again. Once in three or four years the bed should be dug up and replanted. You will then have enough bulbs to plant two beds and give some to your less enterprising neighbors. There are other spring flowering bulbs that are very desirable and beautiful, but I would begin with the tulip. It is less expensive and easily managed and a genuine surprise to those who have never grown them.

On the farm, or elsewhere, I would, if possible, devote a small plot of ground to the cultivation of annuals. In fact, this is the class of plants most commonly seen in farm yards. Much pleasure can be derived from them, and the children become interested, and each one wants a little flower garden—and they should have one for their very own to do with as they please, even to the pulling up of the plants and seeds to see how they grow. One restriction should be laid, viz., not one weed must go to seed. It saves work and gives good results to have no set form for the annuals. I would not make beds in the grass plot for annuals. The grass is nice without flowers, and with the exception of the tulip bed and, perhaps, some clumps of peonies I would not break into the grass plot. The good man will use his scythe to better advantage and with less friction on both scythe and temper if the flower beds are few and far between; besides, I am afraid those shrubs, evergreens and border I have suggested will stretch his good nature to the extreme. I would take a part of the vegetable garden if near the house, as it surely should be, and appropriate that for my annuals. They should have a sunny place, and if you can have them where you can see them through your workroom window, so much the better. I would not have too many kinds, and they will have a better effect if planted in masses, each variety by itself.

I always plant my seed in boxes or in beds and transplant to the garden when the plants are large enough and the ground sufficiently warm. Most annuals are easily transplanted if the ground

is in good condition. If the sun comes out bright and hot, you may need to shade them for a few days.

If you wish to have poppies you must sow the seed (preferably in the fall) where the plants are to grow; they have a tap root and will not bear transplanting. There is no prettier sight than a mass of Shirley poppies when in bloom. When you once get a stand you will always have them unless you pick every seed pod before it ripens, which I think is the better way, or they will soon take possession of the whole territory and the roadside as well; and the quality of the blossoms soon become very inferior. Better save seed every year from the choicest flowers only, and destroy the other seed pods. All must consult their own individual taste as to the kinds.

Every one loves sweet peas, and if you can have a single or double row planted to shut off the vegetable garden from the flowers it will have a good effect. If the row runs north and south you will get more flowers; but plant them any way or where you will, but they *must* have sun to give flowers.

Petunias are very satisfactory, giving so much for so little. They are so nice to pick for bouquets. They, like poppies, will reseed, but the flowers will soon become poor. It is better to start with fresh seed every second year, or even every year for best results.

Drummond phlox is another favorite of mine. It is so bright and cheering, and the children like it so much, and it is so nice for bouquets.

On one side of your plot plant some nasturtions; let them run over a fence, trellis or ground; they will flower beautifully either way.

I would try to have some asters for fall blooming. Nothing is prettier for the season. Do not plant them too closely—not nearer than fifteen inches; farther is better unless they are of the dwarf varieties. One must gauge the number of varieties grown by the space and time they wish to devote to them. It is better to grow a few well, than attempt too much.

I would never raise the beds very much, if any; they dry out too quickly. You can have the ground plowed every year with the vegetable garden, or, if the good man will, let him or the boys spade or fork up the space where you wish to set your plants, leaving a space between the beds or blocks unspaded for walks. Never have your beds larger than what will make them easy and convenient to hoe or weed without stepping on the beds. Do the work from the paths. Have them wide enough to walk and work in easily between the blocks or beds. Have a light, pointed hoe, a hand weeder

and a trowel, and you will need to do little hand weeding unless the ground is very foul when you take it in charge. I would not take such a piece of ground if I could conveniently avoid it, but if I did I would try very hard that *first* year to master every weed, expecting to see better times and less work the next. If you will stir the ground lightly, not deeply, around the plants frequently, they will thrive without any extra amount of water, even in very dry weather. Never let the ground bake. Stirring the surface soil frequently is the one potent factor in gardening.

Every one likes pansies, and perhaps no other flower is so universally liked and recognized by men and boys; so, if I had boys I would try very hard to grow pansies. They are more difficult to manage under ordinary conditions than most other plants; still, if they are *pleased* with their treatment they so quickly show it by their smiling faces that we always long to have them. Usually about the middle of March I plant seed carefully one inch apart in boxes (which are four or five inches deep) containing good, friable garden soil with some drainage in the bottom of the box. I cover the seed lightly and cover the box with a folded paper and keep that paper wet. I set the boxes in a cool room. In about two weeks the seeds will germinate. Then remove the paper and gradually expose to the air and sun. Harden them up at last by putting the boxes outside in a sheltered place, paying strict attention to watering. Sometimes I transplant to larger boxes, putting the plants two or three inches apart before the final transplanting to the garden. This gives better roots and stronger plants, I think. Still you will succeed with once transplanting if the ground is in good condition and the weather favorable. Do not transplant to the garden until they have four or five leaves and the roots have reached the bottom of the box. They should have good, rich soil, enriched with *well rotted* manure. Have the bed deep and the soil friable. They should always have the morning sun; if they can be protected from the afternoon sun the better. The east side of the house is a good place for pansies. They need frequent stirring in the soil; a baked surface is death to pansies. In very dry weather give them occasionally a thorough soaking. Unless you make this thorough, reaching to the bottom of the bed, you had better let them alone; a sprinkling will only injure them. Never let them go to seed. Pick all flowers as soon as they commence to fade. The more flowers you pick, the more you will have. The same is true of sweet peas and nearly all other annuals.

If the housewife can and will devote a short time each day to the cultivation and enjoyment of a few easily managed flowers she

will gain in health, strength and added interest in life. I know this is so from my own experience. I can feel and sympathize with every housewife in her continuous toil and care for every member of her household, until at times she is so weary that she wonders if life is worth the living and feels as though she would fain fold her hands in eternal rest. At such times step into the garden; take a puff of fresh air away from the heated stove, and be refreshed, strengthened and brightened up before the *gude mon* and the bairns come in to their usual meal. Put a bouquet on the table, and he will think his courting days have come again.

SYRINGA COLUMBIANA.

PROF. S. B. GREEN.

This is a very nice syringa from Oregon. The flowers are much larger than those of our ordinary garden syringa, and the

SYRINGA COLUMBIANA.

plant is more compact. I think it the best syringa that we have ever grown on our grounds. We have had it something like ten years, and it has scarcely been injured in any winter during that time.

BEES AND HORTICULTURE.

(Edited by Eugene Secor, Forest City, Iowa, and published by the National Bee-Keepers' Association.)

It is most likely that the higher order of flowering plants and pollen-gathering insects, including honey-bees, were created about the same time, because the best development of the one depends upon the existence of the other. Pollen and honey are necessary for the preservation of certain forms of insect life, and the distribution of pollen by insects seems to be essential to the best development of the plants visited by them. This has been believed for a long time by careful observers, but many farmers and fruit growers have regarded bees as of little importance, and some have even classed them as enemies. Honey bees are here referred to, because they are the most important of all the pollen distributing insects. They appear in greater numbers early in the season, and their great activity renders them more potent in this field of usefulness than any other species.

It is now quite well understood that insects are absolutely necessary to a crop of cucumbers, melons or squashes, and bees are kept for the purpose of pollinating them when grown on a large scale, if there is no apiary in the neighborhood.

The honey bee as a pollen distributor is perhaps of greater value to this country than the crop of honey produced. It has of late years occurred to scientists that the honey bee is of more benefit for distributing pollen than all other sources combined. That we are largely indebted to the honey bee for both quantity and quality of our fine fruits there is but little doubt, and not only fruits, but vegetables and cereals commonly grown on the farm.

Bees are not the only insects that are valuable in pollenizing flowers, but if we note very closely we shall find that only on a very small scale compared with the honey bees do other insects accomplish much of this work. The honey bee is a general pollen gatherer wherever pollen is to be found, and thus works an extensive territory. Bees thoroughly canvass several miles in diameter in search of both pollen and honey, and are always pollen distributors, whether they are engaged in gathering honey or pollen.

Who has not seen the cornfields with their heavily laden tassels of pollen swarming with honey bees? Also the clover fields, the buckwheat fields, the orchards, the vegetable fields, the strawberry fields and almost every wild flower that produces either fruit or seed is daily visited by the busy bee, perhaps every hour in the day, thus distributing pollen from flower to flower, industriously performing the work that nature intended them to do.

Fruit growers of the present have awakened to the fact that the honey bee is their best friend, and that bees and fruit growing must be closely combined. So it is all along the line of this immense field of labor, depending upon the honey bees principally for successful returns. Who would not be a friend to the honey bee, one of nature's gifts to man? That there are not enough bees to thoroughly supply this want there is little doubt; many neighborhoods have but a few colonies of bees. In support of this I would refer you to the state of California, which is the most extensive bee-keeping state in the Union, and also the same in the production of fruit.—National Rural.

The failure of orchards to yield satisfactory crops from year to year after reaching the normal bearing age is of frequent occurrence, and although adequate explanations can often be given for such failure yet the reasons are sometimes very obscure. In the course of other investigations the writer has demonstrated that cross-pollination is an important factor in the production of pome fruits.

One of the ways by which the benefits of crossing are insured to plants is through their sterility to their own pollen. Some fifty or more species of plants are already known to be more or less completely fruitless when only pollen from the same plant is applied to their flowers, although the same plants mature fruits and seeds when pollen from another plant is used.

The nectar in pear blossoms is secreted copiously in the disk, often filling the cup with a large drop, and serves to attract bees and other insects, as does also the pollen. The white, showy petals are a guide to the insects, and as the flowers grow in clusters and the clusters are numerous, a tree in full bloom attracts insects from long distances. When a bee alights on the flower, the stigma brushes from its hairy coat some of the pollen which adhered to it in previous visits to other trees, and if these trees were of a different variety the flowers are thus cross-pollinated. The pistils mature two or three days before the stamens of the same flower, and the fully expanded stigma often protrudes through the petals before they are open, thus being pollinated from some earlier opening flower before the pollen of its own flower is ready—another means by which cross-pollination takes place.

Among the sorts of pears which were found to be more or less completely self-sterile are the Anjou, Bartlett, Clairgeau, Clapp's Favorite, Easter, Howell, Lawrence, Louise Bonne de Jersey, Sheldon, Souvenir de Congress, Superfin and Winter Nelis. Many

of the common varieties of pears require cross-pollination, being partially or wholly incapable of setting fruit when limited to their own pollen. Varieties that are absolutely self-sterile may be perfectly cross-fertile.

Pollen is transported from tree to tree by bees and other insects, and not by the wind. Bad weather during flowering time has a decidedly injurious influence on fruitage by keeping away insect visitors and affecting the fecundation of the flowers, and, conversely, fine weather favors cross-pollination and the setting of fruit.

The normal typical fruits and, in most cases, the largest and finest specimens from both the so-called self-sterile and self-fertile varieties are crosses.

The apples resulting from some of the experiments were collected and studied, and the results were found to be parallel with those obtained in the experiments with pears, the crosses being larger, more highly colored and better supplied with seed. For example, the hand-crossed Baldwin apples were highly colored, well matured and contained abundant seeds, while the self-fertilized fruits were only slightly colored, were but one-fourth or two-thirds the regular size and seedless. The crosses were, in other words, like the better specimens of apples not bagged from the same tree, and the self-fertilized fruits corresponded with the undersized, poorly-colored specimens.

The number of insect visitors in any orchard determines to a great extent the amount of cross-pollination carried on. The pollen of the pear and the apple is not produced in sufficient quantity nor is it of the right consistency to be carried by the wind, and the pollination of these trees is therefore dependent on the activity of insects. In an ordinary spring there is usually an abundance of these insects to thoroughly cross-pollinate orchards of a few hundred trees, but in the case of large commercial orchards, especially where several are close to each other, there is not a sufficient number of insects for cross-pollination when the main body of trees is in bloom if there is no apiary in the neighborhood. Therefore, each large orchardist should keep a number of hives of bees. Honey bees and other members of the bee family are the best workers in cross-pollination.

Be sure there are sufficient bees in the neighborhood, or at least within two or three miles, to properly visit the blossoms. When possible, endeavor to favor the bees by selecting sheltered situations for the orchard or by planting windbreaks.—Prof. M. B. Waite in Year Book Dept. of Ag. 1898.

Bees are also very useful to the horticulturist, as they are able to carry pollen from one flower to another and thus fertilize the flower. As many of our fruits are self-sterile, they could not fruit without this help from the bees. Careful experiments by entmologists have shown that bees are not guilty of cutting open grapes and other fruits, as their mandibles are too weak and are not designed for such work. It is, of course, true that after the fruits have been torn open by wasps, birds, etc., the bees feed on the pulp and juice. —Prof. Hunter, of Kansas, before the Am. Nurserymen at Chicago, June 14, 1899.

If bees are kept from fruit blossoms by netting or other artificial means, the amount of fruit set is little or none. It not infrequently happens that inclement weather prevents or hinders the flying of bees during the period when the flowers are receptive. A fruit tree, half of which was subjected to a continuous spray of water during the flowering period, produced no fruit upon the sprayed portion, but an abundance upon the other. A failure due to the above mentioned cause cannot well be prevented, but may be modified by having bees near at hand to utilize the short favorable periods which do occur.

An insufficient supply of bees will hinder the setting of fruit. While other insects may take part in the carrying of pollen, the fruit raiser must rely chiefly on honey bees. Experience shows that, though the hungry bees may fly two or three miles, hives should be within half a mile of the orchard or small-fruit patch.—Press Bulletin No. 8, of the Kansas Experiment Station.

The value of the honey bee to the horticulturist is hardly realized by many who are engaged in fruit growing. The setting of fruit that will stay on the tree depends chiefly upon proper pollination, and in this work the bee is largely instrumental. There are, of course, other instrumentalities, but none, perhaps, so effective. Experiments at the Oregon station with the peach throw a good deal of light on this subject. A number of peach trees were forced into bloom under glass in November, and a colony of bees was placed in the house as soon as the bloom began. For several days a heavy fog prevented the bees from working, but on the first bright day that came the bees went to work and continued at it as long as there was anything on the trees to work on. The result was that at the stoning season, the time when unfertilized fruit drops, not a peach fell from the trees, and the crop was so heavy that it had to be severely thinned. As a check test, one tree was so protected that the bees could not get at it, and from this tree all the

fruit dropped at the stoning period. Insects, and especially bees, which have nectar secreting instinct as a motive for labor or bloom, are an aid to pollination, for which nature seems to have provided no adequate substitute. Their office is to distribute pollen from flower to flower and from tree to tree. Much of the complaint about fruit falling would cease if horticulturists kept bees in the orchard. For the protection of bees the horticulturist should never spray while the trees are in bloom. He owes that much to these valuable assistants in his work.—Green's Fruit Grower.

In "Bienen-Vater" are given the results of experiments in which netting was put over branches of trees at the time of blooming. The time of blooming on such covered limbs was prolonged as if the blossoms were waiting for the bees to fertilize them. On apple trees the time of such blossoms was prolonged one to three days more than the time of blossoms uncovered. Pear blossoms were prolonged four to five days; plum, four to seven days. No fruit set on the covered apple branches. Some fruit set on the other trees, most of it falling prematurely.—American Bee Journal.

The director of the School of Horticulture at Villorde, France, placed a colony of bees at the disposal of his peach trees, under glass, at the time of blooming in February. The crop, previously scant, was now unreasonably heavy.—La Progress Apicole. (Gleanings.)

Four years ago, when I rented one of the orchards which I am now running, the owners had about a dozen swarms of bees in box hives, and took no care of them except to hive the swarms in more box hives. He managed to keep about the same number of colonies, as the bee moth, which is very bad here, cleaned out about as many colonies as he managed to hive every year. He had a large cherry orchard, and told me that for eight years he did not get a cherry. He was about to dig up the trees when some one advised him to try bees, which he did. The result was that for three or four years after he got the bees he sold his cherry crop in Chicago and New York for about $4,000.00. His idea in keeping bees was only to fertilize the fruit bloom.

I shall increase to one hundred stocks, as I have 140 acres of trees for them to work on.—F. L. Morrill, of California, in "Gleanings," June 1, 1899.

In seven localities in Austria last year, experiments on the fertilizing of fruit blossoms were conducted, according to a concerted plan, on a variety of trees and shrubs, choosing those that

had not borne much the preceding year. In one locality apple blossoms covered from insects bloomed one to three days longer than uncovered ones; pear blossoms four to five days longer; and plum blossoms four to six days. No fruit set on the covered apple boughs and less on the covered pear and plum boughs than on the uncovered ones, much of which fell off prematurely. In another locality the experiment was tried on an almond tree, a pear and a cherry, which bore fruit in abundance on the uncovered branches. All the covered blossoms remained in bloom longer, but none developed, except one of the almond blossoms, apparently because it rubbed against the covering, and this withered without a kernel. In the third locality, two covered apple boughs bloomed three days longer than the others, and no fruit developed, while the uncovered branches bore in abundance. In the other four localities the experiments and results were so similar it is not worth while to mention them particularly. The whole forms a convincing proof that insect aid is necessary to the fruit industry.—Bee-Keepers' Review.

It is a truth demonstrated beyond question, by Darwin and by many other scientists, by our Department of Agriculture and by my own experiments, that many flowers are sterile to their own pollen or to that of the same variety of fruit. It is also true that pollination is always necessary to seed production, and usually to the production of the pulp in case of our berries, pomes, drupaceous fruits, etc. There seems as little doubt but that some fruits usually or sometimes fertile to their own pollen, or to that of the same variety, are under less favorable circumstances sterile to the same. Thus, the Bartlett pollen, though occasionally under favorable circumstances it fruits well though no other pears are in the vicinity, yet in these exceptional cases no one knows when the tide will turn, and the Bartlett fail to produce unless other pears are hard by to insure cross-pollination. We are sure, then, that mixing of fruits so as to secure cross-pollination is absolutely essential in almost all cases to the best success, and in a large proportion of cases to any success at all.

Again, this cross-pollination requires insects to carry the pollen grains from the anther of one bloom to the stigma of another. Before the orchards were planted the fruits were less numerous, and the solitary scant-insects were sufficient to do the work; but as we mass the fruits in great orchards, the native solitary insects were all too few, and fortunately the social bees were brought along with the fruits. Even the social native insects, like the social wasps and bumble-bees, are very few in spring when the fruits bloom, and so

are absolutely inadequate to pollinate our orchard trees. The non-seeding of red clover for the early first crop is because the bumble-bees are too few to properly cross-pollinate the bloom. It is possible that in this case the flowers are fertile to the pollen of other red clover blossoms but not to their own.

The orchardist then must have the bees. To drive them away would be to kill the goose that lays the golden egg.

Again, bees never attack sound fruit. They only come when bird, wasp or sultry weather, combined with over-ripeness, break the rind and cause the juice to exude. Possibly bees could bite open the skin of the fruit, but positively they never do. Yet let the juice once ooze, and the bees quickly hie to tree or drying tray, and leave little behind to show what was once there.

When we remember that nearly 90 per cent of the ripe fruit is juice, and that the bees take this, we see that little would be left. The juice often oozes from very ripe fruit, and so bees are often in the vineyard to the great annoyance of those who would gather in the vintage. Fruit on the trays in the drying-yard has the skin removed, or is cut open, and so the bees may take most of it unless repelled by sulphuring, which is now generally done. We see, then, that bees are a disturbance at times, and annoy the orchardist greatly. Then must the apiarist be driven off? Not so, say the European pomologists. They want the bees, and there is no quarrel between the two industries. Not so, say the most intelligent fruit-men of our own state and country, for we must have the bees to aid us in time of bloom.

What then? It may be wise to move the bees temporarily on rare occasions when the annoyance is most severe. If so, who should bear the expense? Surely, not the bee-keeper, for he was the pioneer in the region and has a first, or at least an equal, right. The removal is for the fruitman, and he should be at the most, if not all, of the expense. But each should know all the facts, that bees are never harmful to flowers, but always necessary to best success, and they are only injurious to wounded fruit; that if they are temporarily removed it is for the good of the fruitman, and he should bear the expense. The harm is usually not great, and the annoyance usually almost nothing, so that if the bee-men and the fruit-men donate the one to the other their choicest products, and cultivate good-feeling and not enmity, each may be a tremendous blessing to the other, and all the best of neighbors.—Prof. A. J. Cook, Los Angeles Co., Cal.

It is pleasant to have our popular beliefs endorsed by scientists. Over the world the popular belief has been that the bumble-bee was needed to secure a crop of clover seed. Prof. Chas. W. Burkett last year covered patches of clover heads six feet square with mosquito netting. He gives the results as follows:

The result showing the number of seeds in each 100 heads was as follows: First crop, covered, 0; uncovered, 10. Second crop, covered, 2; uncovered, 612. Near bumble-bees' nest 2,300. Of course all insects were excluded, but the experiment proves that insects are necessary, and we know that bumble-bees are the principal workers in the pollination of clover blossoms. So the old theory still holds.

The careful experiments of Prof. Waite and others at the experiment stations show that the honey-bee is quite as essential for the perfect pollination of most of our fruits as the bumble-bee is in the clover fields. In Germany the bumble-bee is protected by legal enactments. With us every nest is destroyed at once after discovery.—Prof. J. L. Budd, Horticulturist, Iowa Ag. College.

One of the laws of nature is that the crossing of races produces offspring with greater vigor, endurance and facility of reproduction.

Fruits succeed better when the pollen which fertilizes the pistil comes from some other blossom; and the insects are entrusted with the mission of transporting this pollen from one blossom to another while gathering it for their own use. In some plants, fertilization would have been impossible without the aid of insects. For instance, some plants, such as willows, are dioecious, having their male organs on one tree and their female organs on another. * * * * If those horticulturists who regard the bee as an enemy could exterminate the race, they would act with as little wisdom as those who attempt to banish from their inhospitable premises every insectivorous bird which helps itself to a small part of the abundance it has aided in producing. By making judicious efforts early in the spring to entrap the mother-wasps and hornets, which alone survive the winter, an effectual blow may be struck at some of the worst pests of the orchard and garden. In Europe, those engaged extensively in the cultivation of fruit often pay a small sum in the spring for all wasps and hornets destroyed in their vicinity.—Langstroth on the Honey-Bee as revised by Dadant.

Bees are not only florists, they are fruit producers. Our orchard and fruit crops and leguminous seeds, constituting together no inconsiderable fraction of human food, are very largely dependent upon insect agency, and the fee paid for professional attendance

on the part of the little inoculator is nectar. Let us take, as an example, the apple, a fruit which, from a ultilitarian point of view, has in this country no equal. Its pretty blossom carries five stigmas; to each stigma belongs a division of the compound ovary constituting the core of the fruit. The stigma comes to maturity before the anthers. Bees seeking nectar get dusted completely, and then transfer the granules to the stigmas of neighboring blossoms. * * * * The apple, as its blossom indicates, is, strictly, a fusion of five fruits into one, and demands for its production in perfection, no less than five independent fertilizations. If none are effected, the calyx, which really forms the flesh of the fruit, instead of swelling, dries and soon drops. An apple often develops, however, though imperfectly, if four only of the stigmas have been pollen dusted, but it rarely hangs long enough to ripen, the first severe storm sending it to the pigs as a windfall. I had 200 apples, that had dropped during a gale, gathered promiscuously for a lecture illustration, and the cause of the falling, in every case but eight, was traceable to imperfect fertilization.

* * * * * * * * * * *

Among the small fruits gooseberries are absolutely dependent on insects. The failure of this crop is not so uniformly the result, as some suppose, of frost; cold weather at the critical time, keeping the bees within, often being the chief cause.—Prof. Frank R. Cheshire, an English author of recognized scientific standing.

THE DUST MULCH IN MINNESOTA.

W. W PENDERGAST, HUTCHINSON.

Notwithstanding the adverse reports that occasionally come to us from farmers and gardeners whose experiments have, for some reason, proved unsatisfactory, both winter and summer, mulching will continue. As so much has been written and said about the winter protection of trees, shrubs and plants, I shall try to confine myself to summer cultivation and the subject assigned. Although the fact is now clearly established that in the production of staple crops and commodities now in demand the world over and commanding a market anywhere Minnesota stands at the head, it is also true that she, too, has her drawbacks. I do not refer to the cold winters, for there are few, if any, states in the Union that can boast of such pleasant, exhilarating, healthful winter weather as we have here. Sometimes, too, we hear complaints about the high winds, alleged to be very disagreeable, but there is little ground for this complaint, for the actual fact is that the average velocity of the

wind here is but three-fifths as great as in New England, whence the charge against Minnesota generally comes. The one thing which injures us more than all other physical factors combined is the scant rainfall of August and September. This year there has been no reason to grumble, but the usual condition during the latter part of the growing season is that of dryness. It seldom makes itself felt early enough to seriously damage the small cereals and other early ripening crops, but flax, millet, all roots and also fall pasturage often suffer greatly from drought. Corn, though strictly a cereal, ripens late but has such power to resist heat and dryness that a general failure is unknown. Occasionally it happens that the whole summer is dry, and all crops are more or less injured.

This brings us to the all-important question, can the tiller of the soil do anything to relieve the situation when unkind fate refuses the earlier and the later rains? In cultivated land much may be done by conserving the moisture already stored up in the ground and giving it to the crops for their exclusive use. There will always be two enemies to fight: first, *leaching,* which will be mentioned later; second, *evaporation,* which operates in two different ways, one direct from the surface of the ground and the other indirect, through the leaves of the weeds that everywhere infest the cultivated fields. Fortunately both forms can be fought at the same time and both subdued by the self same weapon, the cultivator. It provides the dust mulch to avoid direct evaporation, and by destroying the weeds stops the exhalations from their leaves.

Direct evaporation is simply the action of the thirsty air as it wanders over the surface, licking up the moisture which capillary attraction has brought up from the lower layers of soil and placed within its reach. This attraction is the same as that which causes water to rise in fine glass tubes above the level of that on the outside. The saturation of a lump of sugar by inserting one corner in a cup of tea is a familiar illustration of the work that is constantly going on underground. When the interstices of the underlying strata are of the right degree of fineness, when the soil is sufficiently firm and compact and of uniform texture, capillarity goes steadily on, and an almost incredible amount of moisture is daily lifted from beneath the ground to the surface.

Evaporation from growing weeds is often very much greater than that which takes place directly from the surface. Every one is familiar with the fact that trees afford decided protection from light showers and from the first part of a heavy rainfall. In the middle and far west about one-fifth of the rain which falls where the ground is covered with trees and other vegetation is evaporated

from the leaves on which it collects without touching the ground at all and from them is returned to the air again.

A matter of the greatest importance to the farmer and horticulturist is the fact that for each pound of dry matter contained in the vegetation grown upon a field or garden four hundred pounds of water, on an average, have been evaporated from the foliage of the plants or weeds, which have pumped it up from the moist earth only to breathe it out again from the leaves.

To the foregoing must be added the direct evaporation from the surface. This varies greatly with varying conditions. In a finely comminuted soil underlaid with clay, where the pores have not been disturbed and capillarity is well established, it may be nearly equal to the entire rainfall, and the land in a dry year be worthless on that account. In a clayey loam, containing one-fourth or less of the amount of moisture required to bring it to the point of saturation and receiving *the most favorable tillage,* direct evaporation may be less than one-tenth of the precipitation.

There is another way by which a part of the rainfall disappears from the soil and fails to be of benefit to the crops. I refer to the downward and lateral movement by percolation. This, however, amounts to but little except where the soil is almost pure sand or gravel with no impermeable understructum within a long distance of the surface. In loams or clays the movement is exceedingly slow and, following, as it does, the general slope of the land, it takes a long time to get beyond the roots of the plants or out of the reach of capillary attraction.

But this attraction has a tendency to bring the moisture to the surface to be carried away by the air. It must be remembered that by the action of this force water may move downward or laterally as well as upward. It tends from the wettest parts towards the driest ones. Whenever the surface by reason of evaporation becomes drier than the earth several feet below, the subterraneous water begins to creep upwards through the minute pores of the ground till it reaches the top, whence it is spirited away by the absorption of the atmosphere. This is not only a dead loss of so much life giving water, but it also to a considerable degree cools the soil and retards the growth of the crops, which is equivalent to shortening the season.

Now we are brought face to face with the great problem which every tiller of the soil, in order to achieve the highest success, must solve. How shall the vast amount of water now carried off by evaporation, and worse than wasted, be retained in the soil and made to subserve some useful purpose? As it is now, for the most, the

dry surface orders an invoice from the ground water beneath. The draft is honored, and capillarity is the water bearer who delivers it as directed, but the treasure is immediately seized by the wanton wind, and the loss cannot be repaired. This process is continually repeated till the earth becomes dry to a point which the plant roots, with all the aid they can get by capillary attraction, cannot reach; so the leaves dry up,and the crop fails unless timely rains come to its relief, which at this season of the year we are not warranted in expecting. What shall be done? The pumping up process must continue; the crops demand it—in fact, it is a matter of life or death with them. But *they* and not the surrounding atmosphere must have the benefit.

Evaporation then or, at least, the larger part of it must be stopped, and the plant roots must have a chance to utilize the moisture heretofore wasted. This is no chimerical idea, as it has been successfully practiced in the semi-arid lands of Washington for several years, and the system is now firmly established. In the Big Bend of the Columbia, for instance, where the annual rainfall is but half as great as ours, good crops of fruit, peas, potatoes, beets, carrots and onions are grown every season, and large yields of wheat and barley are secured without fail once in two years. This result is attained by saving the snow-water of the winter following the crop year until that of another winter is added to it, when the land is ready for another heavy yield. "Of course," every farmer will say, "that is important and in the highest degree desirable, but how can it be done?" The question is not a very difficult one, and the farmers whom it confronted were not long in reaching a conclusion. They pretty effectually checked direct evaporation by keeping the surface covered to the depth of two or three inches with a light, open dust mulch, and indirect evaporation by allowing nothing to grow on the soil during the off years.

The movement of water from the moist depths of the earth is constant until some obstruction is met. A stratum of coarse gravel and pebble stones offers such obstruction, the pores not being sufficiently fine to invite capillarity to do its work. A soil, air-dried or nearly so, by sun, wind and the absorptive power of vegetation, permits only a slow and feeble movement of water through it. When, to such a condition as has just been described is added an exceedingly light, dry and open textured dust blanket, the bar to the further upward movement of capillary water is well-nigh complete. The reason for this will be readily seen when it is understood that capillary attraction is but a form of adhesion and can take place only when the liquid has a stronger power of adhesion to the substance

with which it is mingled than that of cohesion among the molecules of the liquid itself. In other words, when the liquid will wet the substance with which it is brought into contact capillary attraction will take place. Quicksilver instead of rising in glass tubes above the general level will always be depressed below it.

From what has been said it will now be plain that, since water is slow to penetrate a dry and open-grained material, the movement of that contained in the unsaturated soil a few inches below the surface up through the light, powdery dust blanket spread out above it will be so slight as to do comparatively little injury. Every one who has tried to absorb with a blotting pad a drop of ink accidentally let fall upon his writing paper by inserting a corner of the pad into it has discovered that the blotter must be moistened before the water will feel the influence of the attraction. Moisten the blotter a little and the ink at once rises from the writing paper and distributes itself through the pad.

Dry, powdery soil is a much greater obstruction to the upward movement of water by capillarity than the unmoistened blotting pad, and, to make it a still greater bar, it does not come in contact with water or even with soil that is near the point of saturation; the texture lacks firmness, the pores are disconnected and too large. More than all else, the established connection between the soil below and the upper portion or dust mulch is thoroughly disturbed, so that the passage ways of the ground water to the surface are closed and surface evaporation is brought to a stand still. This accounts for the fact that in a comparatively dry time moist earth is found in a naked fallow but a few inches from the top of the ground which has been kept well pulverized, while in an adjoining field of heavy oats you may dig a foot or more without striking moisture. In the first case, the water which was in the ground at the beginning has been locked up there and safely kept; in the second, though the direct evaporation has been trifling the indirect has been enormous. Not less than six hundred tons having been absorbed by the air from every acre.

We may say, then, that in order to carry a crop through a drought as successfully as possible, two things are essential: (1) Capillary attraction must go on constantly, otherwise the little water near the surface will soon be taken up by the plant roots, and food being thus withheld the crop suffers, and if rain does not soon come to its relief will perish. (2) The amount of water that finds its way to the air above must be reduced practically to zero, so that the water which is brought up by capillarity from the depths below will

all be utilized in the chemical preparation of the meals which the growing crops demand.

The conservation of moisture in a fallow field is comparatively an easy matter. A light, shallow, powdery dust blanket, renewed by harrowing whenever a crust is formed, and complete eradication of weeds, are all that is required. Cultivated crops, like corn, potatoes, beans, beets, carrots, peas, etc., are not much harder to manage, because in good farming the weeds *must* be cleaned out, and the best way to dispose of them is by repeated, shallow cultivation, begun early when the weeds are small and easily killed and kept up through the season—and this is the most approved way of making a dust mulch. Of course, in a dry time capillarity will not furnish all the water necessary for the welfare of the crops unless the subsoil is completely saturated in the early season and underlaid with clay or impermeable rock which does not slope enough to allow the surplus water to drain away toward some river or follow the general slope of the country in the direction of the sea. Egypt offers a good illustration of the advantage of thorough saturation and a good dust mulch to prevent surface evaporation. Only the most intense cultivation will warrant any attempt to ameliorate the unfavorable conditions which induce loss by leaching, except by the introduction of humus. Pulverizing the top soil, however, to the depth of two or three inches entails little expense, insures a better crop for the current year and forestalls the usual growth of weeds for the next year.

Carefully conducted experiments have shown that a good garden loam when pulverized will absorb only half as much water as before, and when the conditions are the same it will be more than twice as long doing it. When the pulverized earth lies loosely on the soil in its natural state, with no established connection between the pores of each, the time is indefinitely increased. It is true that the force of capillarity increases with the fineness of the soil, and up to a certain point this is also true as regards the fineness of the grains which compose the soil, but when these are very fine and floury the interstices become so clogged as to well-nigh shut off the upward movement of water altogether. In such lands deep plowing and subsoiling only will ameliorate the natural condition of the ground, and the pulverized surface will check the up-creeping water, offering it to the plant roots before the air can lay its clutches upon it.

To prevent the loss of water by leaching, little can be economically done. Increasing the amount of humus by plowing in green manures and the admixture of a small quantity of clay with sandy soils make them more retentive.

To reduce the amount exhaled by vegetation, in the somewhat arid regions of the Big Bend, to which reference has been made, less than half the seed is sown which we think necessary, thirty pounds of seed to the acre being the maximum in wheat culture. All weeds must be destroyed. Shoal cultivation of all plants grown in rows must be thorough and frequent. I say *shoal* because if the powdered soil extends too far down, capillarity will be arrested below a large portion of the roots and the crop will languish. Lastly, a loose, friable surface should be given to the fields of cereals sown broadcast or in close drills by running a light, broad harrow over them when the grain gives promise that it will be able to choke down the weeds and take care of itself till harvest time. It is not claimed that any method known to the best farmers and gardeners will always insure a heavy crop on all land in the dryest seasons, but it is not too much to hope that, on most soils, the yield may be materially increased when the rainfall is scant, by utilizing the dust mulch to retain a portion of the water actually held by the soil at the outset.

Mr. Jno. Freeman: A neighbor of mine has been setting out for several successive years a young orchard, and I observed that he paid very strict attention to cultivation, extremely so, more than I had ever done or noticed any one else do. He continued this exhaustive cultivation for two or three successive years. I am not advised in regard to the kind of trees he set out or the different nurserymen that he dealt with, but the result is that his trees are nearly all dead, trees ranging from three to seven years old. They have been replaced several times, but he carried out this plan of cultivation, and the result is that his trees are nearly all gone.

Prof. N. E. Hansen (S. D.): That brings out the point Mr. Wedge referred to, which I believe to be at the foundation of all our orcharding. Five years ago I came out to South Dakota with the idea that top-grafting on hardy stock would produce us all sorts of hardy apples. It took three years to get that idea out of my head. We have to begin below the surface. The fact is that everything below the surface for a large part of Minnesota must be Siberian, and that is my idea now. I tried the wild crab apple, and they only lasted one winter; they were all gone the next spring. If every farmer has to mulch his orchard in order to save it, he is not going to mulch it, and his orchard will die. If you put in an orchard on true Siberian crab stock your orchard will stand. My own experience with the seedlings I got from Washington was that they were hardly alive when they reached me, and I had to pot them. These seedlings came through the winter before last with the ther-

mometer 40 degrees below zero, and they came through in perfect condition. I had to transplant them last year, so last fall, a year ago this fall, they were not bigger than the ordinary one year apple seedling. This year they have made a growth of four to five feet. The buds of some of the standard apples like the Wealthy, Duchess and Hibernal have made a growth of four to five feet. I have no doubt at all that there will be no trouble. I do not intend to mulch. Some of those Siberian crab seedlings were so poor I did not pay any attention to them in the fall. They were left in the pots all summer and were left out doors all winter, and the present spring they leaved out the same as the others. If I have any prophecy to make it is that our apple trees will be smaller than they are now, and they will have to be planted closer together; it will dwarf them, but you will have an orchard which you will not have to mulch. That is my opinion, subject to change, of course; my opinion is that we will have the same experience the Russians have had. They had to go outside of their own country to get stock hardy enough. There is no stock, Russian or American, that will stand forty below zero. We have to go entirely outside of the standard apple for stock in the northern part of Minnesota, in North Dakota and in the northern part of South Dakota. When you get to Iowa, the banana belt, I have nothing to say.

The President: I want to say to my friend, Mr. Freeman, not in the way of answering his question, but to show that the case he quoted is not at all conclusive. Thirty-four years ago I bought several thousand trees, some of them large enough to set and some root-grafts, from Mr. Sherman, of Rockford, Ill. I had never heard of any dust mulch. Every one of those trees was dead within three years, within four at any rate. Does that show that the application of the dust mulch kills trees? Some have their orchards on tops of hills, while others who have their orchards on the slope lost all their apple trees. Does that show that those on the slope of the hill generally fail and those who have their orchard on the hill top always succeed? We have got to show that those trees my friend speaks of were killed by want of water, for we have to water them through the dust mulch, and if it can be proven that the dust mulch cut off the supply of water so that they did not have enough, or if in either case he can prove that they had too much water and the dust mulch gave them an extra amount, more than they ought to have had, that would be more conclusive, but simply the fact that he placed them there and cultivated them well, gave them this dust blanket, and they died, does not seem to me to prove much of anything. You will find men practicing all kinds of cultivation in all kinds of locations that lose all their trees. One man I know bought some and put them right in the raw prairie sod. He dug large holes and put them in, and they bore heavy crops for many years; but it does not follow

that the best way is to seek out a piece of virgin prairie and set your trees in that.

Mr. J. S. Harris: Thirty-three years ago the Rockford nursery sold a good many trees in Minnesota. Every tree I bought was black hearted, and those trees survived three or four years and finally went under. My friend from Austin told you of an orchard he knows of. I have visited that orchard and am convinced that it is taken care of better than any I have ever seen, and he bought his trees in Minnesota and set them out, and they commenced bearing and bear large crops every year. I have been there twice, and he has a model orchard.

Prof. Green: It seems to me in discussing this mulch question the thing is rather run together instead of divided as it should be. One part is protection against summer drouth, and another is protection against winter cold. Some agree with my friend, Prof. Robertson, that the proper time to put it on is in the summer for summer drouth, which is correct, and for winter protection we put it on at this time. I do not believe it was a good thing to mulch in June. I believe in trying to protect against summer drouth, and I believe in a late application to protect against winter drouth. I be-believe in the dust blanket as a protection against summer drouth and mulching against winter drouth. You can use mulching in summer or cultivate to protect against summer drouth, and you can do the same thing in winter. In case of strawberries I believe in mulching against winter drouth. I believe the small strawberry crop is on account of hard freezing. I believe it is simply a weakening of the plant due to severe freezing. While I believe it may be well to make these general statements, the thing has got to be considered in detail.

Next Summer's Flowers.—Prepare for the summer flowers by securing some reliable catalogues, select the varieties most desired and order the seeds early. Make a plan of the grounds you are going to use and mark off the beds on paper. Some pleasant day have the flower beds covered with well-decayed manure. This enables it to leach into the soil, and it is also there when in the rush of spring work it might be forgotten. As early as possible spade the soil deeply, fine it down ready for planting, but do not put the seeds in the ground until the soil is warm. Slow maturing varieties had better be started in the house.—E. C.

LA CRESCENT TRIAL STATION, MIDSUMMER REPORT.

FRANK I. HARRIS, SUPT.

In accepting the position of superintendent of this station to succeed my lamented father, I do so with a great many doubts, both as to my ability and leisure to complete the experiments under way, all of which were planned under the personal supervision of the departed. Before proceeding further, I wish to embrace this opportunity to thank the many friends who have expressed sympathy and offered words of encouragement in our bereavement.

So much additional work and responsibility has fallen on my shoulders in settling up the estate and assuming new duties that but little could be accomplished by way of experiment. Concerning condition and prospects of fruit after so mild a winter, I was surprised to find red raspberry bushes badly injured, but with this exception everything came through in good shape. I attribute this damage to a late fall growth and immature canes.

Strawberry vines wintered finely, but were hurt by dry and hot weather in early spring, and the result was a moderate crop but of excellent quality, which sold readily at paying prices. As to varieties, the Warfield is still the leader, both as to yield and quality, and Bederwood the most profitable fertilizer, outranking Michel's Early three to one in yield and quality. Splendid comes next and is rightly named, and Clyde and Brandwine were good. I was rather disappointed in Nick Ohmer, Excelsior and Rough Rider for trial and discarded Glen Mary. Raspberries, both black and red, are maturing a light crop of excellent quality, and the Loudon has jumped to the front again.

It not being bearing year for apples, not much was expected, and while a good many new varieties blossomed not much fruit remains on the trees after the destructive wind storms we have experienced, and that little is poor in quality.

Plums blossomed heavily, but a light crop only will mature.

Cherries set a good crop, but the "early bird" harvested it before ripened.

Grapes are in excellent condition, and a good crop is expected.

A number of peach trees blossomed profusely and promise to mature several bushels of fruit.

Blackberries wintered well but are likely to be injured by heat and drouth.

HORTICULTURE AT THE PROSPECTIVE ST. LOUIS EXPOSITION.

(Extract from circular issued by the management.)

"Horticulture naturally divides itself into two sections, the first that of growing vegetables and fruits, the second that of ornamental or recreative horticulture. The first of these may be again divided into garden economics and pomology. The exhibits relating to the first will include soils and fertilizers, and the principles of gardening, tools and appliances as distinguished from those of agriculture, species of vegetables and specimens of cultivation, plans and drawings of hothouses, methods of heating, etc. Pomology will treat of all of the tree fruits, as well as strawberries, melons, pineapples, bananas and nuts of all kinds. To this may be added seed raising, methods and appliances, the fruit market and statistics of trade. The section devoted to ornamental horticulture will include pictures representing gardening of the past and present, the Dutch formal gardening, Japanese miniature gardening and examples of the curious and beautiful in the art of gardening, with specimens of plants and their cultivation. Modern landscape gardening will be shown by photographs, plans and drawings, bedding plants, ornamental bulbs, hardy perennials, shrubbery, roses, shade and ornamental trees, the window and roof garden, house plants, fern culture, the lawn and its care, the pleasure conservatory, orchid culture, propagating houses, flower markets and the flower and seed trade."

THE CRIMSON RAMBLER ROSE.

This superb rose is of the polyantha class and was originally received from Japan, being introduced into England in the fall of 1893.

The plant is of vigorous growth, making shoots of from eight to ten feet during the season, rendering it a charming pillar rose. It is also magnificent in bush form, and for covering buildings, trellises, etc., it cannot be excelled. One of the striking characteristics of this rose is its color, which is of the brightest crimson, which remains undimmed to the end, showing none of the objectionable purplish tint so common in crimson roses.

The flowers are produced in pyramidal panicles, or trusses, each carrying from thirty to forty blooms, the individual flowers measuring about one to one and a half inches in diameter and remaining perfect on the plant for upwards of two weeks, with their freshness of color unimpaired. The foliage is bright green and glossy, and contrasts finely with the bright crimson of the flowers. It is quite hardy, having successfully withstood the winter, even in Minnesota, when properly laid down and covered.

An eastern writer in speaking of it says: "With me at this date (July 6) this rose is grand. I have a dozen large plants on prepared land on turf. I did not prune much, merely shortening back and placing stakes to support the long growths. I gave a liberal mulch early in the spring, with the result that the growths are very strong, and the clusters of bright crimson flowers at this date beautiful. On one shoot alone I counted over 300 blooms."

PROGRAM ANNUAL MEETING, Minneapolis, Dec. 3-6, 1901.

ANNOUNCEMENT.

The annual meeting is to be held in the lecture rooms of Plymouth Congregational Church, located on the corner of Nicollet avenue and Eighth street. These rooms were found last year especially well adapted to our purpose, the main room being sufficiently large for all the sessions and the evening lectures, with adjoining rooms for the fruit display which are both commodious and well lighted. There are also other rooms well adapted to the meetings of the societies that affiliate with us and which meet at the same time and place. These rooms are all on the ground floor, and are reached from the street on either side of the building.

A special effort is being made to get out at this meeting a full exhibit of all the long keeping seedling apples of merit originating in this state, and to this end premiums amounting to $60.00 have been offered (see last page of this program). Aside from this the usual large display of fruits will be made. Let each one bring what he can, and be sure to get out all good seedlings in his neighborhood.

A large meeting is assured. Delegates from all the horticultural societies near us will be there and a good sprinkling of visitors to add to the interest.

Don't forget the annual banquet, which will be the most enjoyable single feature of the meeting.

Will you be there? Reduced railway fares and low hotel rates make this an economical time for you to visit Minneapolis and attend the largest meeting this society has ever held. At least it should be such, as our membership was never so large, bordering now very close to the coveted 1,000.

And don't fail to bring the wife along. She should be a member of the Woman's Auxiliary and lend a hand at the gathering.

Hotel Vendome, 21 South Fourth Street (between Nicollet and Hennepin aves.) has, for the fifth time, been selected as headquarters for visiting members and friends, and special rates secured of 50 to 75 cents per day of one in a room; two in a room $1.00 per day. One of the best popular priced restaurants in the city is located on the ground floor of this building. Register as "horticulturists" and you will be well treated. A very comfortable and pleasant hotel, with all modern conveniences, only one-half block from our secretary's office and library, in the Kasota Block, and four blocks from the place of meeting.

The Minnesota State Forestry Association.

This association will hold a joint session with the Horticultural Society on Thursday afternoon. (See program on page 10)

A business session is also announced to be held immediately following the "joint session" noted above. All members are urged to be present. For reduced railroad rates, see paragraph below.

Minnesota Bee-Keepers' Association.

The officers of the Minnesota Bee-Keepers' Association announce that the annual meeting of that society will convene Wednesday and Thursday, December 4 and 5, in the same building as the Horticultural Society. See program within.

For reduced railroad rates see paragraph below.

The Woman's Auxiliary.

This society will hold a joint session with the Horticultural Society on Wednesday at 3:00 o'clock p. m., and its annual business session on Thursday at 3:30 p. m., in some room in the building to be announced at that afternoon's session of the Horticultural Society. All ladies interested in horticulture are earnestly invited to be present and connect themselves with this association.

REDUCED RAILROAD RATES.

TAKE NOTICE.

Those attending either the Minnesota Bee-Keepers' Association, the Minnesota State Forestry Association, the Woman's Auxiliary or the Minnesota State Horticultural Society should all secure certificates from the railroad agent where the ticket is purchased, stating that fare has been paid from that point to Minneapolis. Do not fail, also, to get a similar certificate at each railroad transfer point where you may have to purchase a ticket en route.

These certificates should all be handed to Secretary A. W. Latham, of the Horticultural Society, at the earliest opportunity after reaching Minneapolis. They will be signed good to return for one-third fare Dec. 6th and for three days thereafter.

DON'T FAIL TO GET A CERTIFICATE.

Come, *everybody* interested in any branch of horticulture! It is *your* loss if you stay away.

W. W. PENDERGAST, President,
Hutchinson.

A. W. LATHAM, Secretary,
207 Kasota Blk., Minneapolis.

A TEN MINUTE LIMIT.

On account of the fullness of the program and to allow plenty of time for discussion, those presenting topics are requested to limit themselves to **ten minutes** in their reading.

PROGRAM.

TUESDAY MORNING SESSION.

9:30 o'clock.

Invocation.

MUSIC.

Greeting by President W. W. Pendergast.

Appointment of committee on credentials.

General Subject—Commercial Small Fruit Growing.

NINE TOPICS.

1. Planting and Care of a Field of Red Raspberries.
   F. J. Empenger, Bederwood.
2. How to Get the Most out of Black Raspberries Commercially. O. M. Lord, Minnesota City.
3. The Blackberry Field as a Venture.
   Wm. Sandrock, Rushford.
4. Currants and their Treatment in the Commercial Garden. S. R. Spates, Markville.
5. Strawberries by the Acre.
   Thos. E. Cashman, Owatonna.
6. Strawberry Culture on a Large Scale.
   J. L. Herbst, Sec. Wis. State Hort. Soc., Sparta, Wis.
7. Implements for Small Fruit Culture.
   R. A. Wright, Eureka.
8. Picking and Packing Small Fruits for Market.
   C. E. Older, Luverne.
9. Marketing Fruit by Association.
   Rolla Stubbs, Bederwood.

Renew your membership or become a member by paying the Secretary $1.00.

TUESDAY AFTERNOON SESSION.

2 o'clock.

General Subject—Commercial Vegetable Gardening.

NINE TOPICS.

1. Succession of Crops in the Vegetable Garden.
   W. G. Beardsley, Minneapolis.
2. The Hot-bed and its Uses in Vegetable Gardening.
   Paul Burtzloff, Stillwater.
   C. B. Waddell, St. Louis Park.
3. Onions by the Acre.
   Alton M. Shepherd, Minneapolis.
4. Melons as a Field Crop. L. P. Lord, Owatonna.
5. Varieties and Culture of Sweet Corn.
   D. M. Hamilton, Minneapolis.
6. Early Tomatoes in the Open Ground.
   T. T. Bacheller, Minneapolis.
7. Ginseng as a Garden Product.
   Howard Simmons, Howard Lake.
8. Marketing the Vegetable Products.
   Frank Code, Minneapolis.
9. The Relative Value of Home Fertilizers.
   Prof. C. B. Waldron, Fargo, N. D.

The Farmer and Horticulture.
C. H. True, Secy. N. E. Iowa Hort. Society, Edgewood, Ia.

How Plants May be Improved.
W. W. Pendergast, Hutchinson.

Appointment of committees on award of premiums, president's address, obituaries and final resolutions.

TUESDAY EVENING SESSION.

8 o'clock.

Address:

IMPROVEMENT OF PUBLIC AND PRIVATE GROUNDS,

by Hon. C. M. Loring, Minneapolis.

Profusely Illustrated by Stereopticon Views, many of them beautifully colored, showing the results of improvements along the lines suggested in the address.

A REVELATION!

Do not Fail to Attend this Special Feature of our Program.

You can become a life member by payment of $10.00, in two annual payments of $5.00 each if you prefer. This will entitle you to a file of our bound reports, a library in itself.

VISIT OUR LIBRARY

DURING THE MEETING.

207 Kasota Block, Corner 4th Street and Hennepin Avenue.

It will be found open and lighted evenings during this meeting. All are welcome.

WEDNESDAY MORNING SESSION.

9 o'clock.

General Subject—Ornamentation of Public and Private Grounds.

TEN TOPICS.

1. Landscape Adornment a Universal Obligation,
   Jonathan Freeman, Austin.
2. Beauty and Utility in Ornamentation about the Farm Home, Hon. A. K. Bush, Dover.
3. Improvement of Private Grounds,
   C. C. Dike, White Bear Lake.
4. The Nurseryman's Part in Landscape Adornment,
   O. F. Brand, Faribault.
5. An Ideal Public Park,
   Fred Nussbaumer, Supt. of Parks, St. Paul.
6. Laying Out and Caring for the Rural Cemetery,
   A. W. Hobart, Supt. of Lakewood Cemetery, Minneapolis.
7. Parks for the Smaller Towns, Illustrated,
   F. H. Nutter, Park Engineer, Minneapolis.
8. Perennial Phlox, W. E. Fryer, Mantorville.
9. Native Shrubbery in Ornamentation,
   Lycurgus R. Moyer, Montevideo.
10. The Ponderosa Pine, A. Norby, Madison, S. D.

Would you like to be one of the 1,000 Members this Society is to have in 1902 ? Pay $1.00 to the Secretary.

WEDNESDAY AFTERNOON SESSION.

1:30 o'clock.

FIVE SUBJECTS.

1. My Experience in Horticulture and Tree Growing on Coteau Farm, O. C. Gregg, Lynd.
2. Heat in the Orchard, Prof. Wm. Robertson, St. Anthony Park.
3. Legal Protection for the Owner of a Seedling Fruit, J. M. Underwood, Lake City.
4. The Fertility of Fruit Blossoms, Prof. F. A. Waugh, Burlington, Vt.
5. An Orchard Experience of One-third Century, A. Wilfert, Cleveland.

3:00 o'clock.

The Ladies' Auxiliary—Joint Session.

SEVEN SUBJECTS.

1. The Farm Mother and Her Flowers, Mrs. Minnie A. Cummings, Eden Prairie.
2. The Possibilities of Country Home Grounds, Mrs. O. C. Gregg, Lynd.
3. An Amateur's Notes on Outdoor Improvement, Mrs. Florence Barton Loring, Minneapolis.
4. The Possibilities of Club Work in the Rural Districts, Mrs. Anna B. Underwood, Lake City.
5. Woman's Part in the Improvement of Farm Home Grounds, Mrs. Virginia Meredith, St. Anthony Park.
6. School Gardens and Others, F. M. Powell, Glenwood, Ia.
7. An Undeveloped Field in Flower Culture Among the Children, Mrs. Mildred Meta Barnard, Minneapolis.

Entertainment and address by Bee-Keepers' Association at State Experiment Station Wednesday evening. See page 14 of this program.

THURSDAY MORNING SESSION.

9 o'clock.

A VERY IMPORTANT SESSION.

General Subject—Annual Reports.

President's annual address, W. W. Pendergast, Hutchinson.

Annual report of the executive board, Wyman Elliot, Chairman, Minneapolis.

Annual report of secretary, A. W. Latham, Minneapolis.

Annual report of treasurer, A. B. Lyman, Excelsior.

Report of legislative committee, Wyman Elliot, Chairman.

Reports of Vice-Presidents,

Jonathan Freeman, First Cong. Dist., Austin.
C. E. Older, Second Cong. Dist., Luverne.
Mrs. A. A. Kennedy, Third Cong. Dist., Hutchinson.
W. J. Tingley, Fourth Cong. Dist., Stillwater.
A. D. Leach, Fifth Cong. Dist., Excelsior.
Frank Mesenburg, Sixth Cong. Dist., St. Cloud.
J. L. Adams, Seventh Cong. Dist., Glenwood.

Reports of Superintendents of Trial Stations.

Prof. S. B. Green [Central Station], St. Anthony Park.
E. H. S. Dartt, Owatonna.
Dewain Cook, Windom.
Chas. W. Sampson [grapes], Eureka.
O. M. Lord [plums and small fruits], Minnesota City.
H. M. Lyman [apples], Excelsior.
F. I. Harris, La Crescent.
L. R. Moyer, Montevideo.
Mrs. Jennie Stager, Sauk Rapids.
Wm. Somerville, Viola.
J. S. Parks, Pleasant Mounds.

Report of Committee on Fruit List.

Clarence Wedge, Albert Lea.
J. P. Andrews, Faribault.
Prof. S. B. Green, St. Anthony Park.

Report of Committee on Ornamental List.

F. H. Nutter, Minneapolis.
L. R. Moyer, Montevideo.
Fred Nussbaumer, St. Paul.

Report of Committee on Seedling Fruits.

Prof. S. B. Green, St. Anthony Park.
O. M. Lord, Minnesota City.
F. W. Kimball, Austin.

Reports of Local Societies.

Southern Minnesota Horticultural Society, Mrs. Chas. Brainerd, Sec'y, Albert Lea.
Meadow Vale Hort. Club, A. W. Keays, Sec., Elk River.

THURSDAY AFTERNOON SESSION.

2 o'clock.

THE MEMORIAL HOUR.

JOHN S. HARRIS.
JUDSON N. CROSS.
WM. MACKINTOSH.
PROF. OTTO LUGGER.

Addresses by Judge H. G. Hicks, Hon. S. M. Owen, and others.

3 o'clock.

Annual Election of Officers.

Announce annual session of the Woman's Auxiliary in adjoining room.

Minnesota State Forestry Association, Joint Session.

SIX SUBJECTS.

1. Forestry in Minnesota. Chas. M. Loring, Pres. State Forestry Ass'n, Mpls.
2. The Aesthetic Side of Forestry. Alfred Terry, Slayton.
3. Minnesota's Interest in Forestry. Gen'l C. C. Andrews, Chief Fire Warden, St. Paul.
4. Special Course in Forestry in the University. Prof. S. B. Green, St. Anthony Park.
5. Present Status of the Park Question. Mrs. W. T. Bramhall.
6. Minnesota's Greatest Opportunity in Forestry. H. H. Chapman, Grand Rapids.

Business session of the Minnesota State Forestry Association.

THURSDAY EVENING,

8:00 o'clock.

ANNUAL SOCIETY BANQUET.

At a place to be announced at the meeting. Procure tickets of the Secretary.

FRIDAY MORNING SESSION.

9 o'clock.

Report of committees on award of premiums and President's address.

General Subject—The Commercial Orchard.

NINE TOPICS.

1. Varieties for the Commercial Orchard, J. A. Howard, Hammond.
2. Preparation of Soil for the Commercial Orchard, J. C. Hawkins, Austin.
3. Laying Out the Commercial Orchard, with Diagram, R. H. L. Jewett, St. Paul.
4. Getting the Trees and Planting the Commercial Orchard, Thomas Tunis Smith, St. Paul.
5. Top-Working Young Trees, Illustrated, F. W. Kimball, Austin.
6. Cultivation of the Commercial Orchard before and after Bearing, Roy Underwood, Lake City.
7. Gathering the Increasing Crop from the Commercial Orchard, W. S. Widmoyer, Dresbach.
8. How to Sell the Crop from the Commercial Orchard and Get Full Value in Exchange, Carl Vollenweider, LaCrescent.
9. Varieties and Culture of Cherries in the Orchard, Frank Yahnke, Winona.

FRIDAY AFTERNOON SESSION.

1:30 o'clock.

General Subject—Improvement of Fruits.

SEVEN TOPICS.

1. Growing Seedlings to Improve the Apple and Plum, Wyman Elliot, Minneapolis.
2. Practice of Budding and its Relation to the Improvement of Fruits, Illustrated, R. S. Mackintosh, St. Anthony Park.
3. Selection of Wood for Grafting, Clarence Wedge, Albert Lea
4. Adaptation of Stock and Grafts in Improving Fruits, A. J. Philips, West Salem, Wis.
5. Bud Variations and "Sports" in Improving Fruits, Prof. S. B. Green, St. Anthony Park.
6. Science and Practice of Cross-Pollination, Prof. N. E. Hansen, Brookings, S. D.
7. Influence of Cultivation on the Permanent Improvement of Fruits, Dewain Cook, Windom.

Unfinished Business.

Report of Com. on Obituaries and Final Resolutions.

4:00 P. M.—Two Minute Speeches by Members.

MUSIC.

4:30 P. M.—Closing Remarks by the President.

PROGRAM

THIRTEENTH ANNUAL MEETING

MINNESOTA BEE-KEEPERS' ASSOCIATION,

To be held in Minneapolis, Minn., Wednesday and Thursday, Dec. 4th and 5th, 1901. Sessions to be held in Plymouth Church, corner Eighth Street and Nicollet Avenue. Go in on Eighth street side.

OFFICERS.

President, Wm. Russell, Minnehaha Park, Minn.
First Vice-President, Geo. A. Forgerson, Rosemount, Minn.
Second Vice-President, G. H. Pond, Bloomington, Minn.
Third Vice-President, Dr. Mary McCoy, Duluth, Minn.
Secretary, Dr. L. D. Leonard, Minneapolis, Minn.
Treasurer, L. E. Day, Clinton Falls, Minn.

EXECUTIVE COMMITTEE.

H. G. Acklin, St. Paul, Minn., H. B. VanVliet, Farmington, Minn., Dr. E. K. Jaques, Robbinsdale, Minn.

WEDNESDAY MORNING SESSION.

9:30 o'clock.

Call to order.

Invocation, G. H. Pond, Bloomington, Minn.

SONG—"The Honeysuckle and the Bee." Miss Edith Dexter, Staples, Minn.

Reading of the minutes.
Report of executive committee.
Reports of special committees.
Reports of officers.
Receiving communications and bills.

Question Box. "Should we, or not, join the National Bee-Keepers' Association"? C. Theilmann, Theilmanton, Minn.

Bee-Keepers' Program.—Continued.

WEDNESDAY AFTERNOON SESSION.

1:30 o'clock.

SONG—Wm. Reuter and Miss Mary Reuter, St. Paul.

"Some Facts in Favor of Joining the National Bee-Keepers' Association, J. P. West, Hastings, Mrs. H. G. Acklin, St. Paul, Minn.

President's Address, Wm. Russell, Minnehaha Park, Minn.

Votes, for or against, joining the National Bee-Keepers' Association in a body, collected by the treasurer, L. E. Day, Clinton Falls, Minn., announced.

SONG—"Buckwheat Cakes and Honey," Master Eddie Holmberg, St. Paul, Minn. Accompanyist, Miss Ethel Acklin, St. Paul, Minn.

"Some Problems and Queries in Practical Bee-Keeping," J. W. Murray, Excelsior, Minn.

SONG—Miss Julia Mondeng, Minneapolis, Minn.

Question Box.

WEDNESDAY EVENING SESSION.

8:00 o'clock.

At State Experiment Station, St. Anthony Park, Minn.

Bagpipe Selections, Wm. Russell, Minnehaha Park, Minn.

Scotch Dance, Miss Maggie Russell, Minnehaha Park, Minn.

Music, Songs, etc., by Students at State Experiment Station.

Stereopticon Lecture, W. Z. Hutchinson, President National Bee-Keepers' Association, Flint, Mich.

Bee-Keepers' Program—Concluded.

THURSDAY MORNING SESSION.

9:30 o'clock.

Piano Solo—Miss Edith Dexter, Staples, Minn.

"Large Hives and Prolific Queens." W. J. Stahmann, Bruce, Wis.

"Queen Rearing." G. R. Frye, River Falls, Wis.

"Some of My Experience in Keeping Bees Fifty Years." Wm. Cairncross, Plato, Minn.

Question Box.

THURSDAY AFTERNOON SESSION.

1:30 o'clock.

Song—"Hum of the Bees in the Apple Tree Bloom" Little Miss Ethel Acklin, St. Paul, Minn.

"Disposing of the Honey Crop to the Best Advantage." A. D. Shepard, River Falls, Wis.

"Shade and Ventilation." Walter R. Ansell, Milaca, Minn.

"Wintering Bees." J. B. Dexter, Staples, Minn.

"Bucking against Nature with Bees." John Collins, Wyoming, Minn.

Piano Duet—Leonard Bros., Minneapolis.

Election of Officers.

Question Box.

Instrument furnished by Metropolitan Music Co. Minneapolis, Minn.

Please do not forget to buy your tickets for the Horticultural meeting and take certificates for them, to get the reduced railroad rate. See page 3 of this program for particulars.

PREMIUM LIST.

All exhibits must be entered with the secretary and in place the first day of the meeting to be entitled to compete for premiums.

Exhibitors competing must be members of this society, and the growers of the articles exhibited.

The rules governing the horticultural department of the Minnesota State Fair will be applied except where they conflict with this list.

APPLES.	3d Prem.	1st Prem.	2d Prem.
Collection, not to exceed 10 varieties	$2.00	$6.00	$4.00
Each variety of apples (or crabs) included in the 1901 fruit list of this society, or in the 1901 premium list of the Minnesota State Fair (kept in cold storage)		.50	.25
Each variety of apples (or crabs) included in the 1901 fruit list of this society, or in the 1901 premium list of the Minnesota State Fair (not kept in cold storage)		.50	.25
Peck of Wealthy apples, the fruit exhibited to be at the disposal of the meeting		2.00	1.00

EARLY WINTER SEEDLING.—The fruit shown must have been grown by the owner of the original tree and not kept in cold storage. A specimen of wood three years old (at least six inches long) taken from the tree bearing the apples shown, and a concise history and description of the tree and its fruit, must accompany each entry.

Competition is open to all except on such varieties as are being propagated for sale by some person other than the originator. Successful competitors who are not members of the society will be made so for the current year by deducting one dollar, the annual fee, from the amount of the award.

Premium will be divided pro rata among all the entries commended by the judges, according to the comparative merit of each as a commercial fruit. Premium $20.00.

LATE WINTER SEEDLING.—Same conditions as for early winter variety except that if found necessary the fruit shown may be retained and final decision reserved till later in the winter. Premium $40.00.

GRAPES.	1st Prem.	2d Prem.
Each variety included in the fruit list of this society for 1901, or in the 1901 Minnesota State Fair premium list	$0.75	$0.50

FLOWERS.		
Collection of ornamental and flowering plants	5.00	3.00
Table bouquet	2.00	1.00

Secretary's Corner.

THE PROGRAM OF THE ANNUAL MEETING.—Was mailed to all members Nov. 15th. If a copy has failed to reach you, send to the secretary for another.

ARE YOU ASSIGNED TO DUTY—At the annual meeting? It is then your *good fortune* to help along the work in what promises to be the best meeting the society has ever held.

A CORRECTION IN THE PREMIUM LIST.—In the premium list for the coming annual meeting, just issued, the premiums on varieties of grapes should be changed to read, "First premium, 75c.; second premium, 50c."

ARE YOU A GROWER OF FRUITS?—You cannot afford not to attend our annual meeting. While you know many things about our art, every person you meet there knows something you don't, of which knowledge it is your privilege to become the possessor. You must also give something in return. Come, and we will do you good.

OUR PROGRAM.—Is a feast of good things, but to get the good of it you must come early and stay till the very end. You can afford to miss neither the first session nor the last. Will you be on hand when the meeting opens at 9:30 o'clock Tuesday morning? One hundred and forty were in attendance at the opening session last year.

ARE YOU A MINNESOTA NURSERYMAN?—As a matter of business you cannot afford to stay away from our annual meeting. You have much of the practical knowledge that the planters of the state need, and this is the opportunity to "give it off"—and you are sure to get some good in return as well as a great fund of pleasure out of fraternal association. Come!

APPLES ABROAD.—A contemporary says that apples are now selling in Denmark for 13 cents per lb. at wholesale, but that American apples packed in barrels, as they are, do not keep well and are not in favor in that market. Russian apples are packed in large boxes in excelsior and will stand shipping and storing a long time. American apples would sell there if packed in that manner.

HAVE YOU EVER ATTENDED OUR ANNUAL MEETING?—Come this year and see what is doing there. While it is true that the proceedings of the meeting are published in our monthly throughout the year, there are yet a host of good things, and really the very best of the gathering, that cannot be put into print. The social element is a large factor in the association and in the great work it is accomplishing. Come and "give and take" with us.

STORING WEALTHY APPLES.—The writer lately received the following letter from the Produce Refrigerating Co., where he had put into cold storage a few barrels of Wealthy apples, and they are the ones referred to in the letter:

"Two barrels of apples, our lot No. 2254, and one barrel of apples, our lot No. 2264, both in storage in your name, are poor keepers and have gone down seriously. We have removed them from the room into the corridor and wish you would kindly take them out as they will shortly be worthless."

This does not necessarily mean that Wealthy apples cannot be kept in cold storage, but it does mean that they will not keep as ordinarily handled. Heretofore the demand for Wealthy for immediate consumption has exceeded the supply, and the growers have not found it necessary to store in waiting for a profitable market. But the time will eventually come when it will have to be done, and it is just as well to practice the necessary conditions a little beforehand. A Wealthy to keep must be got into the barrel *without a bruise* of any

kind, and this means handling as eggs are handled. In fact if they could be packed in cases with partitions as eggs are, and each apple wrapped, the conditions would be ideal. Try a few boxes next year for practice.

INTERESTING NEWS FROM STATE FORESTRY BOARD.—The Minnesota State forestry board yesterday received reports from the auditors of Becker, Cook, Otter Tail and Pine counties, showing that 2,990 acres of land had been forfeited to the state for non-payment of taxes, and that the land is better adapted to forestry than to general agricultural purposes.

Many counties have sent in no reports, and several of the reports received do not give the desired information. Land that accrues to the state for delinquent taxes, after the county commissioners have certified that it is unfit for agricultural purposes, is placed under the care of the forestry board.

As many of the county commissioners through the northern part of Minnesota, where the larger part of such land is located, are known to be favorable to the forestry movement, the members of the forestry board expect a large amount of land will be placed under its care this winter. Until a decision has been made by the county commissioners, the forestry board has no control over such lands.

S. M. Owen was chosen president of the board to succeed Judson N. Cross, of Minneapolis, who died last August. Memorial resolutions were passed on the death of President Cross, who was the originator of the forestry board. —Minneapolis Journal.

A MANITOBA FRUIT DISPLAY.—"A highly interesting and suggestive exhibit of Manitoba-grown fruit was made a short time ago in the windows of one of the large Winnipeg dry goods houses by the Western Horticultural Society, of which Mr. Bartlett, of Winnipeg, is secretary.

"The principal contributor of large fruits was A. P. Stevenson, of Nelson, who showed twenty-two varieties of standard apples, several hybrids, and half a dozen crabs, among the varieties of standards being specimens of the Wealthy and Patten's Greening, both of which are American seedlings, and the following Russian varieties: Hibernal, Anisette, Blushed Calville, Repka Kislaga, Russian Gravenstein, White Rubits, Silken Leaf, Ostrokoff, Cinnamon Pine, Little Hat, Sacharrine, Red Cheek, and a number of others. In crabs, he showed Transcendent, Hyslop, Virginia, General Grant, Philip's 1000, Whitney and Minnesota. The Archbishop of Rupert's Land also showed several nice specimens of apples and three varieties of crabs, which were grown at St. John's, Winnipeg. From Portage la Prairie quite a number of standard apples and crabs were exhibited, Messrs. Lyall showing a very good sample of Duchess apple and Transcendent crab; Cadham, Duchess apple and Hyslop and Transcendent crabs; Alton, Evans, Garnier, Rowe, Logan, Canniff, each with good specimens of crabs. W. G. Fonseca, Chas. Wellband and John Green, of Winnipeg, showed Transcendent crabs. Thomas Franklin, Stonewall, exhibited a great variety of crabs and seedling plums and several apples. In crabs he showed Hyslop, Orange, Tonka, Martha, Virginia, Sweet Russett, Briar's Sweet, and a number of others. This fruit was grown on trees which had the protection of shelter belts or trees."—FARMER'S ADVOCATE, Oct. 5, 1901.

The death of L. H. Wilcox, of Hastings, late in October, is announced. At this writing fuller particulars are not at hand.

Mr. Wilcox was for a number of years an earnest worker in the society, being a member of the executive board for five years consecutively, from 1889 to 1893 inclusive.

Annual Meeting, 1900.

JOURNAL OF THE THIRTY-FOURTH ANNUAL MEETING OF THE MINNESOTA STATE HORTICULTURAL SOCIETY, HELD IN MINNEAPOLIS, MINN., DEC. 4-7, 1900.

(For program of this meeting see page 474, Report of 1900.)

TUESDAY MORNING SESSION.

W. W. Pendergast: Friends of the Horticultural Society:

It is exceedingly pleasant to see so many here at the very beginning, so early the first morning. It is a still grander thing to begin at the beginning and go on through to the end, and listen and learn and get something out of every day's exercises, and I think the fact that we have so many together here at the very beginning is an omen of success.

We will open the exercises this morning with an invocation by Rev. Clarence Swift, of the Park Avenue Congregational Church.

The invocation was then offered by Dr. Swift, after which Mrs. C. S. Hitchcock favored the audience with an instrumental selection on the piano.

The president then announced the following members as a committee on credentials: Alfred Terry, Slayton; W. L. Taylor, Litchfield; O. M. Lord, Minnesota City.

GREETING BY THE PRESIDENT.

W. W. PENDERGAST. HUTCHINSON.

Now, friends, we are ready to commence our work of the week, for we now have got to where we must put in almost a full week, taking Monday to get here and Saturday to go home again.

I have been struck, as I thought the matter over lately, with the growth of this society, from the first I knew it, at the very outset. What a feeble, struggling baby it was in its swaddling clothes! How little by little, and especially during the last eight or ten years, it has been growing, and now see the large and strong giant it is getting to be, a "power in the land" in every part of Minnesota! Yes, in every part of the northwest the Minnesota Horticultural Society is known, and it is known for its good works. We have started out to do something that will redound to the credit of this northwest, and it will go on gathering strength after we, the old "stagers," who

have always been loyal, have passed away entirely. The great glory of this society is to come yet. We are growing faster and faster, our membership is increasing faster, the interest of those who attend the meetings is growing constantly, and we have good reason to "thank the Lord and take courage" in the future. The best thing that we can do in this world, the one that contributes most to our happiness—and that is the great secret of life, is to do our duty as well as it can be done, not as well as we know how to do it, but as well as we can do it. Whether we are struck by a rich or a plain man the pain is just as great, and I would rather have a man working against the right who knows he is working against the right, than one who sincerely believes he is right but is just as far out of the way as the other one, because he has the reputation of being honest and sincere, and his words will carry conviction; and if he goes in the wrong direction, takes the wrong part, thinking it is right, he will do more harm than the one who takes the wrong path knowing he is wrong. So I say again, it is our duty not to do simply as well as we know how, not to follow out the course we may think is right, but to get down to bed rock, and be sure that that course is the right one—and that is what we are undertaking to do in this organization. Find out what is right! Throw all our preconceived notions to the winds! Let them go if the evidence seems to be against them!—and we must find out what that evidence is and duly weigh it, and if it is against us let us get over on to the right side just as soon as we can.

I will not take up much of your time this morning. There is plenty to do, and there are plenty here to do it, and we all want to hear from them, and I do sincerely and heartily invite every one that is here this morning to profit by this meeting.

We have changed our place of meeting to one that is more roomy than the one we were in the habit of using, and it looks as though this was going to be none too large, and that fact is worthy of note and of congratulation. We have reason to congratulate the society that we are starting out so well at this meeting.

I think the preliminary business has all been disposed of, and we are now ready to take up our regular program, and I trust every one will feel perfectly free to take part in the discussions, and to make the discussion of each subject as practical as possible.

The General Subject for this morning is the "Mechanical Preparation of the Soil in Fruit Culture."

"Subsoiling as a Preparation for Fruit Culture." David Secor, Winnebago City. (See index.)

Discussion.

"Subsoiling as a Preparation for Fruit Culture." Frank Yahnke, Winona. (See index.)

"Methods of Plowing as a Preparation for Planting Fruits." Prof. Wm. Robertson, St. Anthony Park. (See index.)

Discussion.

"Protection from Drought and Winter-Killing." G. D. Taylor, Fulda. (See index.)

Discussion.

"'Manipulation of the Soil Necessary or Profitable for a Plum Orchard." Dewain Cook, Windom. (See index.)

Discussion.

"Movement of the Soil in the Successful Vineyard." C. W. Sampson, Excelsior. (See index.)

Discussion.

"Tools for Garden and Orchard Use." S. D. Richardson, Winnebago City. (See index.)

Discussion.

The President: We have a number of delegates with us this morning from some of our sister states, and I am sure we would all be pleased to hear a word of encouragement from them, to hear of their successes to cheer us on our way. I will first call on Prof. Hansen, of the South Dakota Agricultural College, of Brookings.

Prof. N. E. Hansen (S. D.): I have nothing in particular to say of our work, for we of South Dakota come over here to learn from the gray and white heads we see about us. We are laboring under harder conditions than you are in Minnesota. Mr. Cook and Mr. Older can sympathize with us, as can also Judge Moyer. The further west you go the harder the conditions become for growing fruit successfully. We are not discouraged by any means, for we raise a lot of fruit. Our people are plant breeding, and I will tell you what we do. We are breeding the native things mostly. We have just run up against this fact, that farmers will not grow raspberries if they have to lay them down for winter protection; we must raise something that does not need to be laid down. They will not mulch their strawberries, so we must develop something from the native that does not need protection. That is what we are doing there, and we expect to succeed.

The President: I now take pleasure in introducing to you Mr. J. S. Trigg, of the Northeastern Iowa Society. We are glad to have Mr. Trigg with us—I believe this is for the first time—and we hope we shall hear from him often during our meeting.

Remarks by Mr. J. S. Trigg. (See index.)

Alfred Terry: Your committee on credentials has received the credentials of the following persons and beg leave to report that they are properly qualified to represent their respective organizations:

C. L. Watrous, delegate from the Iowa State Horticultural Society; J. S. Trigg, from the Northeastern Iowa Horticultural Society; A. P. Stevenson, Nelson, Man., from the Western Horticultural Society, of Manitoba; Jno. Freeman, of the Southern Minnesota Horticultural Society.

(Signed) ALFRED TERRY,
W. L. TAYLOR,
O. M. LORD,
Committee.

The President: We are very glad, indeed, to have so many of our sister societies represented here, and we would like to hear from each one of them what they are doing in their respective organizations. I will first call on Col. C. L. Watrous to say a few words.

Col. C. L. Watrous (Iowa): I should like to make you a little speech forty or fifty minutes long, but my watch tells me it is considerably after twelve o'clock, and during a rather long life I have found that nothing will so destroy a man's temper as to talk to him when he is hungry. I will deliver my speech when my time comes on the program, but just at present I will spare you.

The President: Col. Watrous is a Quaker and prefers to speak only when the spirit moves. (Laughter.) Now we want to hear from Mr. Stevenson, from the far north across the border.

Remarks by A. P. Stevenson. (See index.)

The President: Thank you, Mr. Stevenson, we are very glad to hear such a report from the far north. Now we would like to hear a word from Mr. Freeman, from the Southern Minnesota Horticultural Society.

Mr. Jno. Freeman: As the official representative of the Southern Minnesota Horticultural Society, I take great pleasure in presenting to you its sincere and hearty greetings. Although this is its first official representation before your honorable body, still that field has been represented for many years in your annual meetings, and the record of its deliberations has frequently appeared in your past reports, and these reports have brought back to us much that was of great benefit and encouragement. I believe this is the third endeavor I have made to be present at your annual meeting, and now that I am here I hope to have a pleasant and profitable time with you. At some future time during this meeting I hope to be able to speak to you more fully of the interests and desires of our southern Minnesota society.

The President: I want to say that all the delegates from these sister societies are heartily welcome here; we give them a sincere and cordial greeting, and should be glad to have them take an active part in our exercises and deliberations here during the week. It is a great mark of appreciation of the work you are doing to be told by people from Manitoba that they have been helped and stimulated by what you have done and that they are dependent upon and draw their greatest help from this society. There are other societies in other states that have helped us along, and we shall always feel under obligations to all the friends from those sister societies that have come here today to give us the advantages of their experience in the past, and if we can say anything in the course

of our deliberations here that will be of any benefit to them or give them a single thought which will help them in their work we shall be very glad to do it.

On motion of Mr. Clarence Wedge the meeting adjourned to 1:30 p. m.

TUESDAY AFTERNOON SESSION.

The meeting was called to order at 1:30 o'clock by the president, and the afternoon's program immediately taken up, the general subject being "The Distribution and Conservation of Moisture in the Soil."

"Drainage of Marsh Lands and Their Uses in Gardening." W. L. Taylor, Litchfield. (See index.)

Discussion.

"The Use of Drain Tile in the Garden and Orchard." R. A. Wright, Eureka. (See index.)

Discussion.

"Methods of mulching and Their Comparative Value." J. S. Harris, La Crescent. (See index.)

Discussion.

"The Utility of the Dust Mulch in Minnesota." W. W. Pendergast, Hutchinson. (See index.)

Discussion.

"Irrigation in the Minnesota Garden and Orchard." R. H. L. Jewett, St. Paul. (See index.) P. M. Endsley, Minneapolis. (See index.) C. W. Spickerman, Excelsior. (See index.)

Discussion.

"Supplementary Plantings in the Orchard and Their Rotation." O. M. Lord, Minnesota City. (See index.)

Discussion.

"General Rotation of Planting on the Small Fruit Farm." C. W. Merritt, Homer. (See index.)

Discussion.

The president then appointed the following committees on awards:

Cold Storage Apples: J. P. Andrews, Faribault.

Apples not from Cold Storage: C. E. Older, Luverne.

Grapes: J. W. Murray, Excelsior.

Flowers: Mrs. H. K. Eves, Minneapolis.

Honey: H. H. Heins, Lydia.

Thousand Dollar Apple Seedling: J. S. Harris, J. S. Parks, O. M. Lord.

Final Resolutions: G. D. Taylor, W. S. Higbee, A. D. Leach.
Obituary: J. S. Harris, D. T. Wheaton, C. E. Older.
President's Address: L. R. Moyer, Frank Yahnke, T. E. Cashman.

WEDNEDAY MORNING SESSION.

"Nursery Culture of the Apple." J. P. Andrews, Faribault. (See index.)

Discussion.

"How to Grow Gooseberry and Currant Plants." Geo. W. Strand, Taylor's Falls. (See index.)

Discussion.

"Propagating New Varieties of Tree Fruits from Seed." Chas. G. Patten, Charles City, Iowa. (See index.)

The reading of this paper was followed by a talk on the same subject by C. L. Watrous, Des Moines, Iowa. (See index.)

"Growing Half-Hardy Fruits." J. R. Cummins, Washburn. (See index.)

"Plant-Breeding." Prof. N. E. Hansen, Brookings, S. D. (See index.)

"Growing Plants in and for the Windbreak." Alfred Terry, Slayton.

"Growing Evergreens from Seeds, and After Care in the Nursery." Clarence Wedge, Albert Lea.

Discussion.

Mr. J. S. Harris: I would like to introduce to the society Mrs. Laura A. Alderman of South Dakota. She has a larger orchard than any to be found in Minnesota.

The President: I take great pleasure in calling upon Mrs. Alderman. We would all be pleased to hear a word from her.

Mrs. Laura A. Alderman (S. D.): This is so entirely a surprise to me that I am at a loss what to say. I think Mr. Harris did not lose sight of the fact that a woman is usually credited with having the last word, but on this occasion you must excuse me.

Prof. Hansen: Whenever we want to conjure by the name of South Dakota we always talk of the "Alderman orchard."

WEDNESDAY AFTERNOON SESSION.

MINNESOTA BEE-KEEPERS' ASSOCIATION.

The joint meeting with this society was called to order by the secretary, Dr. L. D. Leonard. Before beginning the regular program little Miss Ethel Acklin, of St. Paul, entertained the audience with a song.

The secretary then read the following paper:

"Bees and Horticulture—Their Relations Mutual." Dr. L. D. Leonard, Minneapolis. (See index.)

"Something of Interest to Bee-Keepers and Horticulturists." J. P. West, Hastings. (See index.)

Discussion.

THE LADIES' AUXILIARY.

The joint meeting of the Ladies' Auxiliary with the Horticultural Society was called to order at 2:30 by the president, Miss Emma V. White, and Miss Fay Latham entertained the audience with a reading.

The President: Before we begin our regular program we would like to hear a few words from the president of the Horticultural Society, Prof. Pendergast.

"Aesthetic Education." President W. W. Pendergast. (See index.)

"Country School Grounds." Miss Lucia E. Danforth, Carleton College, Northfield. (See index.)

Discussion.

Mrs. H. F. Brown, president of the Minneapolis Improvement League, who was on the program for a paper, was unable to be present, but sent the following letter which was read by the president, Miss White. (See index.)

"Effective Improvements in the Home Grounds with the Smallest Expenditure of Money." Roy Underwood, Lake City. (See index.)

"Outdoor Improvement Work of the Woman's Civic League of St. Paul." Mrs. Conde Hamlin, President, St. Paul. (See index.)

Discussion.

"The Forest Reserve." Prof. Maria L. Sanford, State University." (See index.)

"Agriculture in Our Rural Schools." Prof. W. M. Hays, State Agricultural School. (See index.)

WEDNESDAY EVENING SESSION.

"The Flower Buds of Our Fruit Trees." Prof. E. S. Goff, Madison, Wis. (See index.)

Illustrated address, by Prof. S. B. Green. "My Impressions in Europe."

THURSDAY MORNING SESSION

The meeting was called to order at 9 o'clock by the president, and in accordance with the program the annual reports of the officers were considered.

President: I will say before commencing to read the president's annual address that I have referred again to what I spoke of last year, namely the importance of working together with our neighboring states, each one along a separate line so we will not waste so much time going over the same ground, and I have also spoken of three or four things which seem to me of the greatest importance, to which we might devote most of our attention.

"President's Annual Address." W. W. Pendergast, Hutchinson. (See index.)

"Annual Report of the Executive Board." Wyman Elliot, Chairman, Minneapolis. (See index.)

"Report of Legislative Committee." Wyman Elliot, Chairman, Minneapolis. (See index.)

"Annual Report of Secretary." A. W. Latham, Minneapolis. (See index.)

"Annual Report of Treasurer." H. M. Lyman, Excelsior. (See index.)

On motion of Mr. Elliot the reports of the secretary and treasurer were adopted.

"Report of Superintendent of Trial Station." Dewain Cook, Windom. (See index.)

Discussion.

"Report of Vice-President Second District." S. D. Richardson, Winnebago City. (See index.)

Discussion.

"Report of Vice-President Third District." Mrs. A. A. Kennedy, Hutchinson. (See index.)

Discussion.

"Report of Vice-President Sixth District." Mrs. Jennie Stager, Sauk Rapids. (See index.)

"Report of Vice-President Seventh District." D. T. Wheaton, Morris. (See index.)

"Report of Superintendent of Trial Station." H. M. Lyman (Apples), Excelsior. (See index.)

"Report of Superintendent of Trial Station." O. M. Lord (Plums and Small Fruits), Minnesota City. (See index.)

"Report of Vice-President First Congressional District." F. W. Kimball, Austin.

"Report of Superintendent of Trial Station." J. S. Harris, La Crescent. (See index.)

"Close Planting of Trees." J. S. Harris, La Crescent. (See index.)

Discussion.

"Report of Superintendent of Trial Station." L. R. Moyer, Montevideo. (See index.)

THURSDAY AFTERNOON SESSION.

"Report of Superintendent of Trial Station." J. S. Parks, Pleasant Mounds. (See index.)

Discussion.

Mr. J. P. Andrews, on behalf of the committee on fruit list, presented the following report:

"Report of Committee on Fruit List." (See index.)

Discussion.

On motion of Mr. W. L. Taylor the report of the committee was adopted as read.

The Secretary: I want to refer to a member who is known to nearly every member of our society. He is a personal friend of nearly every member of our society, and we would almost be justified in appointing a committee to express our regret at his absence. As he is not here I think it would be courtesy to appoint a committee to present resolutions of sympathy with him in his condition. He had a partial stroke of paralysis. I move that a committee of three be appointed by the president to draft suitable resolutions to transmit to Mr. Dartt.

The motion was put to a vote and unanimously prevailed.

The President: I am sorry myself that for some reason Mr. Dartt has not been able to be with us. His face has been familiar for years in this society, and I remember years and years ago I always looked for Mr. Dartt, Mr. Harris and Mr. Elliot to be here. I think it would do Mr. Dartt good to know that we sympathize with him in his troubles. I will name as such committee Mr. O. M. Lord, Mr. T. E. Cashman and Mr. Seth Kenney.

THURSDAY AFTERNOON SESSION.

The report of the Southern Minnesota Horticultural Society was presented by Mr. Jonathan Freeman, Austin, the delegate. (See index.)

The regular afternoon program was then taken up beginning with a "Memorial Hour" in honor of deceased members.

Judge L. R. Moyer spoke of the life of Miss Sara Manning; Mr. E. A. Webb, of that of Maj. A. G. Wilcox, and Hon. S. M. Owen, Mrs. A. A. Kennedy and others eulogized the memory of Col. John H. Stevens.

Mr. Oliver Gibbs tendered a brief eulogy on behalf of Peter M. Gideon and then outlined a plan embodied in a resolution for raising a memorial fund, which was thoroughly discussed and unanimously adopted. (See index under "Gideon Memorial Fund.")

ANNUAL ELECTION OF OFFICERS.

The following officers were elected:

President, 1 year, W. W. Pendergast, Hutchinson; members of executive board, 3 years, Wyman Elliot, Minneapolis, J. S. Harris, La Crescent; treasurer, 1 year, A. B. Lyman, Excelsior.

Mr. Wyman Elliot: In order to enlarge our field of usefulness I think our vice-presidents should be changed as often as once in two years, and for that reason I would like to see this year pretty much an entire change made, and I would recommend the following for the various districts: 1st district, Jno. Freeman, Austin; 2nd district, C. E. Older, Luverne; 3rd district, Wm. J. Danforth, Jr., Red Wing; 4th district, W. J. Tingley, Stillwater; 5th district, A. D. Leach, Excelsior; 6th district, Frank Mesenberg, St. Cloud; 7th district, J. L. Adams, Glenwood. That distributes them among the seven districts. It makes a change and brings in some new blood and interest. I simply throw this out as a suggestion.

A ballot being taken for vice presidents the persons above mentioned were duly elected, except that Mrs. A. A. Kennedy was re-elected in 3rd district.

Mr. O. M. Lord as chairman of the committee appointed to draft suitable resolutions on behalf of Mr. Dartt presented the following:

Your committee appointed to report resolutions in regard to E. H. S. Dartt ask leave to submit the following:

Resolved, That we learn with deep regret that his physical condition prevents him from meeting with us at this session, and tender him herewith our fullest sympathy. His familiarity with horticultural work and with the work of this society renders his services to us and to kindred associations invaluable.

Resolved, That his work as superintendent of the Owatonna trial station has been conducted in such an able manner as to command our great respect for his judgment and ability, and that we hereby express our entire confidence that this work has been carefully planned and carried out for what he believed to be the best interests of fruit-growing under our conditions.

O. M. LORD.
SETH. H. KENNEY,
THOS. E. CASHMAN.

On motion of Prof. Green the resolutions were unanimously adopted by a rising vote.

Mr. C. G. Patten (Iowa): I wish to say that I am in hearty sympathy with that resolution, and looking carefully over his work and knowing his feelings and his interest in the horticulture of this country, I feel that this resolution will be an inspiration to Mr. Dartt and give him new courage and hope to live longer that he may see more of the results of his labors. I am in hearty sympathy with the resolution.

Prof. N. E. Hansen (S. D.): I was at Mr. Dartt's place two weeks ago, and I was amazed at the wonderful extent of his work of gathering varieties from all over and originating so many hundreds of his own.

MINNESOTA STATE FORESTRY ASSOCIATION, JOINT SESSION.

The meeting was called to order at 4 o'clock by the president, Capt. J. N. Cross, and the program was immediately taken up with the reading of the president's address.

"Forestry as Applied to Minnesota Conditions." Capt. J. N. Cross, President Minnesota State Forestry Association. (See index.)

Mr. O. F. Brand offered the following resolution:

"Resolved, That this association heartily recommends to the legislature the appropriation, for forestry purposes, of all lands in the state acquired by the state at the forfeited land sales of 1881 and 1900, which lands are evidently worthless except for forestry, the same having been abandoned by the owners for from ten to twenty years."

On motion of Mr. Brand the resolution was unanimously adopted.

"A Lumberman's View of the Forestry Situation." Col. W. B. Allen, St. Paul. (See index.)

"Forest Conditions in Germany." Prof. S. B. Green, St. Anthony Park. (Se index.)

"Wisdom of the National Park Movement." Leo M. Crafts, M. D., Minneapolis. (See index.)

FRIDAY MORNING SESSION.

The meeting was called to order at 9 o'clock by the president and the regular program was at once taken up.

Judge L. R. Moyer, on behalf of the committee on president's address, presented the following report:

"Report of Committee on President's Address." (See index.)

On motion of Mr. O. M. Lord the report of the committee was unanimously adopted.

"Varieties of Apples for Southern Minnesota." R. W. Chapman, Plainview. (See index.)

Discussion.

"Varieties of Apples for Central Minnesota." D. F. Akin, Farmington. (See index.)

Discussion.

"Commercial Orchards for the Northwest." J. S. Trigg, Rockford, Iowa. (See index.)

"Varieties of Crabs for Minnesota Planting." Ditus Day, Farmington. (See index.)

Discussion.

Mr. O. M. Lord: I would like to introduce the following resolution. It has been said that horticulture is not related to agriculture, but horticulture in our state has been largely fostered by our university, and now if we are friends of agriculture we would like to assist them in some of their wants. I will put before you one of their necessities and ask you to assist them in securing what they wish:

"Whereas, The growing needs of various departments of the agricultural portion of the state university require a general or main building to supply immediate requirements and to provide for further growth in the school and experimental work; therefore, be it

"Resolved, That the regents of the university be urged to request the state legislature to provide the necessary funds for such a building, and that the state legislature be urged to make such appropriation as will provide a building which will supply the needs of the institution and shall be a monument to agriculture and rural life."

On motion of Mr. C. W. Merritt the resolution was unanimously adopted.

Mr. Oliver Gibbs: I want to call the attention of the society to a matter of business. A few years ago, I do not remember the year, a rule was established by this society that provides that exhibits similar to ours from beyond the limits of our state would be welcome at our fruit exhibitions, and we practiced that for a number of years. I understand from Secretary Latham that rule has been broken or has gone into disuse, and I know the impression is abroad

that their fruit is not welcome here and for that reason it is not sent. It is but a little way to the state line, and their fruit should be welcome on our tables. The point I want to bring before the society is to find out whether that old regulation ought to stand or whether it should be considered obsolete. Living as I do in Wisconsin, it would not be proper for me to say any more.

"The Transcendent on Trial." J. T. Grimes, Minneapolis. (See index.)

"Varieties of Plums for Minnesota." Wyman Elliot, Minneapolis. (See index.)

Discussion.

On motion of Mr. Elliot the meeting adjourned.

FRIDAY AFTERNOON SESSION.

The meeting was called to order by the president at 1:30, and the morning program taken up and concluded.

"Varieties of Strawberries Suited for Minnesota." F. F. Farrar, White Bear. (See index.)

"Varieties of Grapes Best Adapted to Minnesota." J. W. Murray, Excelsior. (See index.)

"Small Fruits in Northern Minnesota." H. H. Chapman, Grand Rapids. (See index.)

The President: I take great pleasure in introducing to you at this time Mr. Tucker, the principal of the school of agriculture. We are glad to welcome him here and hope he will be a great help to us, and now we will ask him to say a few words to us.

Mr. Tucker: Mr. President, Ladies and Gentlemen: I feel as though I were a sort of an interloper, you have so much to do, and I should not take up any of your valuable time, but President Pendergast wished to introduce me to you and asked me to say a few words. I attended the morning session on Tuesday and enjoyed it very much indeed. I would have been pleased to attend all the meetings, but could not spare the time as I wished. I had the advantage when I first came here in the fall of attending the state fair, which was just being held at that time, and the first department I visited was the horticultural department, and I was surprised at the great results of your work apparent there. I am feeling that you are a company of heroes like the heroes of old that used to battle with the elements. You have battled with the elements of this climate and have conquered. I believe I am one of the newest members of your society, and I hope to meet you personally from time to time. We are greatly interested in the department of your work, and we

hope when we have such an enthusiastic member as Prof. Green we will not lack for young people in the state to carry on the work you have so well begun. We are feeling very happy because eighty of our young men came home from Chicago from the live stock show and brought home so many prizes. Col. Liggett asked me to express to you his regrets at being unable to be present at your meetings, but his absence at Chicago was of such duration that his business demands all of his time at present. I wish to say on behalf of Col. Liggett and on my own behalf that we cordially invite you to visit our institution tomorrow. I had the pleasure of meeting your pioneer, Mr. Harris, at the state fair, and I also met Mr. Latham there. On comparing notes I found that my home town was only seven miles from his town, so you see the world is not very large after all. I thank you for the opportunity of meeting you on this occasion. (Applause.)

"Report of Committee on Seedlings." Prof. N. E. Hansen, Brookings, S. D. (See index.)

Discussion.

"Report of Committee on Gideon Seedlings." Wyman Elliot, Minneapolis. (See index.)

Discussion.

Mr. Oliver Gibbs: Fellow members of the Horticultural Society: We can never pay Wyman Elliot for the kind of work he is doing as shown in his report. He does not work for pay. He is in it voluntarily, for the love of the thing. It is a work that ought to be done, and as an expression of the high appreciation of his work I move that we tender him a vote of thinks for it.

The motion was numerously seconded and, being put to a vote, prevailed unanimously.

Mr. Wyman Elliot: Mr. President and Fellow Members: This has been somewhat of a life work with me in horticulture. I have always had a desire to continue in horticultural pursuits, but years ago it was ordered that I should go in some other track, but now in my older days I want to get back again. If I have done anything that is worthy of commendation that is for others to say, but I hope I may live to continue the work further and that you may hear from me again. (Applause.)

The President: I have a notice in my hand announcing the death in Chicago of Prof. W. H. S. Cleveland. He helped us lay out the campus at the state experiment station and did a great deal of work in the park system of Minneapolis. He was a life member of this society, and some action, I think, ought to be taken on his death.

Mr. J. S. Harris: Mr. Cleveland was made one of our honorary life members on account of that branch of horticulture in which he was so capable, that of landscape gardening. I do not think we can get up any very elaborate resolutions at this time, but I would suggest that in the next issue of our magazine a portrait with a suitable notice and resolutions endorsed by the executive committee be published.

"Laying out the Orchard and Setting the Trees." C. L. Blair, St. Charles. (See index.)

"Laying out the Commercial Small Fruit Farm—General Principles Involved." Thos. E. Cashman, Owatonna. (See index.)

"Laying out the Vineyard and Putting in the Vines." A. D. Leach, Excelsior. (See index.)

Prof. Robertson: I have a list of books here that I think should be in every school district in the state, and I would like to have a recommendation made by the State Horticultural Society stating that this is a suitable list to put in a school library. My object in offering this list is that if a boy wants to know about these practical things he can find a place where he can get them. With this little explanation I would like to move that the Horticultural Society recommend that this list be placed in the libraries of the country school districts of the state.

Mr. J. S. Harris: I would like to have added to that list a copy of Prof. Green's book on forestry and a copy of our transactions.

Prof. Robertson accepted the additions.

Mr. F. W. Kimball: It may be well for the Minnesota State Horticultural Society to endorse this list of books, but it seems to me it ought to have a little more thorough revision, and I would suggest that the whole matter be referred to the executive committee and give them power to act after having given this list a careful consideration. I would offer that as an amendment to Prof. Robertson's motion.

Mr. R. H. L. Jewett: I suppose it is understood that the executive board will have the power to add or subtract from that list.

The President: Yes, if referred to them they would have that authority.

The amendment and the original motion in order were then put to a vote and unanimously prevailed.

Mr. Wyman Elliot: It may not be known that J. W. Thomas & Co. were induced to offer a sweepstakes prive of $100 for two consecutive years, and it would not be more than justice if we were to make Mr. Thomas an honorary member for five years. I would make that as a motion.

Mr. J. S. Harris: While Mr. Thomas is running a store here in the city, he is doing more towards popularizing apple growing than any other man I know of.

The motion of Mr. Elliot was then put to a vote and unanimously prevailed.

Prof. Green: I wish to propose the name of a man for honorary life membership, a man who is interested in the work of the society, who has worked hard for it and who has largely contributed of his time and money to make it a success. He was president of the society for seven years and whether in or out of office he has always worked for the society. I refer to J. M. Underwood, of Lake City, a man highly regarded by the society, and I take great pleasure in offering his name and move that he be elected an honorary life member of this society.

The motion was numerously seconded and, being put to a vote, unanimously prevailed.

"Laying out the Plum Orchard and Handling the Trees in Planting." A. Wittman, Merriam Park. (See index.)

"Laying out and Planting the Strawberry Field." A. W. Keays, Elk River. (See index.)

"Laying out and Setting the Raspberry and Blackberry Patch." Rolla Stubbs, Bederwood. (See index.)

"Laying out and Planting the Currant and Gooseberry Plantation." C. E. Older, Luverne. (See index.)

Discussion.

"The Handling and Transplanting of Evergreens." Prof. C. B. Waldron, Fargo. (See index.)

Discussion.

The President: We have now come to the end of our program and have come to the point where it reads, "Two Minute Speeches by the Members." Now we would like to hear two minute speeches from as many as care to speak. This time is yours and is set apart for this purpose. Perhaps Mr. Freeman has something to say.

The following members participated in these short talks: Jonathan Freeman, A. P. Stevenson, C. M. Loring, Prof. N. E. Hansen, J. S. Harris, Capt. A. H. Reed, Prof. C. B. Waldron, Mrs. L. A. Alderman, Pres. W. W. Pendergast. (See index under title of "Two Minute Talks.")

Mr. President: We are about to separate until the summer meeting, and I sincerely hope we shall be able to be there at that time, and that there will be no more, for one year at least, obituaries to be written, but that when we come here again one year from now we will be just as young, vigorous and hopeful as we are tonight.

The meeting is now closed.

Executive Board, 1901.

RECORDS OF THE EXECUTIVE BOARD FOR THE YEAR ENDING DEC. 1, 1901.

Record of meeting held in the secretary's office at 8 p. m., Dec. 3, 1900.

Present Messrs. Elliot, Moyer, Harris, Andrews, Wedge and Latham.

The books of the treasurer of the society, showing a balance of $762.44, were examined and approved.

The secretary's accounts for the period from June 18, 1900, to date were examined, found correct and his bill of expenses for that period approved and ordered paid—$363.16.

It was unanimously agreed to present the name of J. M. Underwood, of Lake City, Minn., to the annual meeting of the society for an honorary life membership.

Adjourned sine die.

WYMAN ELLIOT,
Chairman Executive Board.

A. W. Latham, Sec.

Record of meeting held at the secretary's office Dec. 7, 1900.

Present, Messrs. Elliot, Pendergast, Green, Harris, Andrews and Latham.

Wyman Elliot was elected chairman for the ensuing year, and A. W. Latham was elected secretary for the same period.

The salaries of the officers were fixed as follows: President, $25.00; treasurer, $25.00; secretary, $900.00.

The following delegates were selected to represent the society: Prof. Wm. Robertson, at Iowa State Horticultural Society; Dewain Cook, South Dakota State Horticultural Society; W. W. Pendergast, Wisconsin State Horticultural Society.

A committee consisting of Messrs. Elliot, Green and Latham was appointed to examine plans of procedure in reference to raising the Gideon Memorial Fund and report to the executive board.

The matter of compensation for the society reporter was referred to the publication committee with power to act.

The following bills were audited and ordered paid:

Plymouth Congregational Church, rent	$60.00
J. S. Harris, Exp., Ex. Board	15.55
H. M. Lyman, Premiums, Annual Meeting, 1900.	110.75
H. M. Lyman, Premiums, Summer Meeting, 1900	80.00

Adjourned sine die.

WYMAN ELLIOT,
Chairman Executive Board.

A. W. Latham, Sec.

Record of Meeting held at the secretary's office, 8 p. m., June 19, 1900.

Present: Messrs. Elliot, Wedge, Andrews, Green and Latham.

A. K. Bush was elected a member of the executive board to fill the vacancy caused by the death of J. S. Harris.

Mr. Bush was also recommended to the society as an honorary life member.

Messrs. S. B. Green, O. M. Lord and F. W. Kimball were appointed members of the seedling committee, in place of J. S. Harris, deceased.

Frank I. Harris was appointed superintendent of the La Crescent Trial Station to fill the place occupied heretofore by his father, J. S. Harris, deceased.

The secretary's bill for society expenses from Dec. 7, 1900, to date, was examined and approved and an order ordered drawn on the treasurer for the amount—$960.70.

A list of books, prepared by Prof. Wm. Robertson, recommended for placing in the common school libraries of the state, was examined and approved.

Adjourned sine die.

WYMAN ELLIOT,
Chairman Executive Board.

A. W. Latham, Sec.

LIST OF MEMBERS, 1901.

ANNUAL MEMBERS.

Acklin, H. G.....1024 Miss. st., St. Paul
Anderson, Nils.....Lake City
Allen, Wm.....Le Roy
Alderman, Laura A.....Hurley, S. D.
Allen, L. W.....Spring Valley
Adler, Leon N.....
100 William st., New York City
Anderson, Mathias.....Lake Benton
Ahlgren, C. J.....Cokato
Anderson, Adolph.....Renville
Anderson, Chase.....
School of Agr'l, St. Anthony Park
Akin, D. F.....Farmington
Alling, S. A.....Homer
Andrews, J. P.....Faribault
Anderson, J. C.....Ruthton
Anderson, A. H.....White Willow
Anderson, Erik.....Lake Park
Anderson, J. H.....Granite Falls
Ahlin, Aug.....Exiter, Cal.
Ackerman, A. W.....Young America
Anderson, Louis.....Rochester
Anderson, P. E.....Kandiyohi
Aultfather, Chas.....Austin
Andrews, Jos.....Hurley, S. D.
Aschenbeck, J. H.....731 4th av. N., Mpls.
Avery, H. M.....Sioux Falls, S. D.
Allen, C. C.....Pipestone
Abbott, C. A.....St. Charles
Andrews, Gen'l C. C.....
833 Goodrich av., St. Paul
Abel, John, Jr.....Buffalo
Amundson, A. A.....Kerkhoven
Anne, Olaf.....Underwood
Adsit, Grant.....Belview
Antisdel, H. N.....Fostoria, Ia.
Alin, Alex.....Fullerton, N. D.
Amos, Chas.....Six Oaks
Archibald, A. H.....Big Lake
Austin, L. E.....Glencoe
Arvidson, F. A.....Providence
Allen, S. E.....Brown's Valley
Andree, J. N.....Brown's Valley
Anderson, A. G.....Worthington
Anderson, H. G.....Norseland
Bratrud, Albert.....Spring Valley
Bailey, J. Vincent.....Newport
Bowers, D. M.....Howard Lake
Becker, J. C.....Adrian
Bacheller, T. T.....Box 1000, Minneapolis
Bruce, W. J.....Idlewild
Bruess, Gust.....Penola
Bruess, Emil J.....Center City
Bakken, A. O.....Albert Lea
Brickey, R. S.....Britt, Ia.
Blom, Ole H.....Hagan
Barsness, J. A.....Spring Creek
Bunnell, M. C.....Newport
Benjamin, J. F.....Hutchinson
Benjamin, R. G.....Hutchinson
Burtness, H. E.....Wilmington
Baskins, C. M.....Charles City, Ia.
Barton, Mrs. Isabella.....Excelsior
Blair, C. L.....St. Charles
Birkeland, C. C.....Willmar
Bost, A. A.....Excelsior
Baillif, R. L.....Bloomington
Beckley, J.....Nerstrand
Brimhall, W. H.....Hamline
Burtzloff, Paul.....Stillwater
Bussee, H. L. F.....Station A, Minneapolis
Broberg, A. J.....Dassel
Bosworth, J. E.....Money Creek
Bennett, A. M.....Box 205, Mpls.
Bohl, Peter.....Albert Lea
Boelk, Ferdinand.....Lansing
Bisbee, John.....Madelia
Beckley, L. H.....Worthington
Buck, Dan'l.....Mankato
Burud, Hoken.....Monse Lake
Bigelow, F. M.....Rochester
Browning, Geo.....Fulda
Broughton, A. L.....511 4th av. S. E., Mpls.
Biller, A. C.....Redwood Falls
Bendixen, C. M.....Morgan
Bedford, S. A.....Brandon, Man.
Barsch, Julius.....Morgan
Bartholomew, M.....Excelsior
Bischoff, John.....Red Lake Falls
Byington, C. H.....Morton
Bentz, P. J.....Woonsocket, S. D.
Babb, G. W.....Bradford
Bonwell, Arthur.....Blue Earth City
Bauer, Frank.....Adrian
Becker, A. M.....Adrian
Boyle, M. S.....Adrian
Brungesser, And.....Hanover
Brown, C. J.....French Lake
Brinck, Oscar.....St. Michael
Bassett, Mrs. G. A.....Preston
Baker, B. F.....Burnt Hills, N. Y.
Brown, Magnus.....Farmington
Baird, Rev. Prof. A. B.....Winnipeg, Man.
Brown, John A.....Windom
Barnard, Mrs. M. M..805 7th st. S. E., Mpls
Burns, Edw.....Caledonia
Boutelle, F. E.....Northfield
Bollum, Martin J.....Belle Chester
Biper, John.....Cologne
Bickerdike, R. N.....Lykens, Wis
Bradt, Sec'y H. H. G.....Eureka, Wis.
Berg, A. A.....Murdock
Balcom, E. L.....Chatfield
Brown, C. F.....St. Peter
Bailey, E. G.....Elk River
Beck, W. B.....Big Lake
Berthelsen, Chris.....Albert Lea
Buss, O. E.....Edgerton
Brenner, J. W.....Canton, S. D.
Baker, Geo. A.....Janesville
Burton, Mrs Albert..Hunter's Park, Duluth
Becker, Ed. W.....Excelsior
Broberg, P.....New London
Brethoist, Mrs. P.....Lennox, S. D.
Broman, Aug.....Lake Elizabeth
Burner, Geo. A.....500 Nicollet av., Mpls.
Cedardahl, O. S.....Owatonna
Cutting, F. E.....Byron
Christensen, P. C.....Fairmont
Cooper, Edw.....Adrian
Carlson, Ludvig.....Lindstrom
Christgan, John.....Austin
Clausen, P.....Albert Lea
Cashman, T. E.....Owatonna
Comee, S. S.....Waseca
Christenson, Peter.....Hutchinson
Cary, L. N.....Mandan, N. D.
Cutler, M.....Princeton
Crockett, E. D..35 W. 33d st., Minneapolis
Cashman, M. R.....Owatonna
Christensen, B. P.....Hutchinson
Cook, Dewain.....Windom
Cowles, F. J.....West Concord
Chapman, R. W.....Plainview
Carroll, R. C.....St. Anthony Park
Cady, LeRoy.....Owatonna
Connor, J. D.....Barnum
Collins, P. V.....Guaranty Bldg, Mpls.
Cummins, Osborn.....Eden Prairie
Chinberg, C. A.....Owatonna
Cross, Mrs. E.....Sauk Rapids
Crooker, Mrs E. B..2212 Oakland av., Mpls.
Christenson, A. O.....Milan
Coleman, W. E.....Owatonna
Cook, F. L.....Spearfish, S. D.
Campbell, Dugald.....Armstrong, N. D.

Cole, W. P.....Sioux Falls, S. D.
Cowles, E. D.....Vermillion, S. D.
Conley, T. G.....Adrian
Cowin, Jos.....Adrian
Comstock, C. O.....Kedron
Childs, Howard.....Adrian
Crone, Ferdinand.....New Ulm
Chamberlin, W. E.....1780 Iglehart st., Merriam Park
Chapman, H. H.....Grand Rapids
Cleland, C. R.....Northfield
Clark, Wm.....Rockford
Charlson, A.....Kenyon
Crawford, M.....Cuyahoga Falls, O.
Cuzner, E. A. Essex and 27th av. S. E., Mpls.
Cuzner, Mrs. E. A.....Essex and 27th av. S. E., Mpls.
Corcoran, Thos.....Seaforth
Chase, J. J.....Concor
Chambers, Alex.....Havana
Carson, F. E.....Chatfield
Cassady, Geo.....Valley Springs, S. D.
Cooke, Mrs. Louisa.....Hutchinson
Clemons, L. A.....Storm Lake, Ia.
Carlson, Chas. A.....Lake Elizabeth
Cedarburg, A. G.....Barrett
Cant, Wm. A.....Duluth
Courtright, W. V.....Farmington
Clausen, H. A.....Sleepy Eye
Case, E. E.....Staples
Daniels, R. L.....Red Wing
Dyer, H. H.....Walker
Dunsmore, Henry.....Olivia
Drake, G. W. M.....Monticello
Dike, C. C.....White Bear Lake
Davis, Francis.....Goodhue
Dolan, F. M.....661 Hague av., St. Paul
Day, A. A.....Farmington
Day, L. E.....Farmington
Dixon, Oscar.....Canby
Davis, E. J.....Cortland
Dunbar, H. N.....Huntley
Dow, F. M.....Alma City
Domrese, Fred.....Magnolia
Duncan, R. A.....Redwood Falls
Dodds, J. E.....Wheaton
Day, S. H.....Northfield
DeWolf, Rev. M. J.....Letcher, S. D.
Dibble, G. L.....Parker, S. D.
Dahl, J. H.....Chandler
Dahl, S. K.....Brownsdale
Doolittle, C. J.....Evansville, Wis.
Davis, A. L.....Buffalo
Dalseng, John.....Starbuck
DeGroff, H.....Avoca
Dakin, W. W.....Hood River, Oregon
Dean, W. H.....Morristown
Degner, F. E.....Pratt
Dunnell, W. B.....616 Bank of Com., Mpls.
Doble, Clarence.....Howard Lake
Dutton, Chas.....Brown's Valley
Davidson, Mr.....Campbell
Delamater, D. P.....Edina Mills
Davison, A. H.....Des Moines, Ia.
Engelrud, Wm.....Morgan
Evans, W. J.....Chatfield
Eves, Mrs. Harriet K..Gen'l Delivery, Mpls.
Eastman, H. C.....Sleepy Eye
Erstad, A. C.....Zumbrota
Endsley, P. M.....Room K, Guaranty Bldg., Mpls.
Eddy, W. H.....Howard Lake
Ericson, Gust. R.....Goodhue
Ellergodt, H. C.....Lanesboro
Esser, Barney.....Adrian
Ellsworth, Geo. I.....Adrian
Engen, C. H.....Norway Lake
Evans, Dr. O. J.....1726 Dupont av. S., Mpls.
Empenger, F. J.....Maple Plain
Erdahl, Absolom.....Dell
Erickson, Albert.....Stanchfield
Erickson, T. A.....Alexandria
Engebretsen, And.....Elk River
Erickson, J. A.....Box 359, Alexandria
Ernst, N. C.....Dodge Center
Engan, John.....Pipestone

Eastman, Mrs. J. D.....Brown's Valley
Fitzer, Chas.....1329 Fremont av. N., Mpls.
Freeman, Jonathan.....Austin
Franklin, A. B.....Sub. Sta. 9, Mpls.
Ferodowill, F. X.....403 Wash. av. S., Mpls.
Felkey, Dan.....Armstrong, Ia.
Ferguson, Wm.....Chatfield
Frick, A. R.....Wayzata
Furleigh, L. S.....5218 Belmont st., Mpls.
Feist, Robt.....Easton
Furber, J. T.....Fairfield, Me.
Facey, M. V.....Preston
Fleming, Albert.....Vernon Center
Felter, H. L.....Washta, Ia.
Frederickson, S. C.....Cobden
Frederickson, Nels.....Morgan
Furgason, O. E.....Luverne
Forest, Geo.....Luverne
Fedderly, A. V.....Redwood Falls
Flinn, Mrs. W. D.....Redwood Falls
Feinler, Rev. F. J.....Parker, S. D.
Felland, L. T.....Sioux Falls, S. D.
Farragher, J. H.....Adrian
Feathers, A. M.....Lismore
Flygare, F. O.....Sherburne
Freeman, Isaac.....Spring Valley
Friberg, C. P.....Clarkfield
Fryer, W. E.....Mantorville
Franze, F. J.....Battle Lake
Frankland, Thos.....Stonewall, Man.
Flatin, G. F.....Spring Grove
Franks, Mrs. H. E.....Pickwick
Frenn, P. J.....Red Wing
Feldman, Jno.....Canton, S. D.
Foss, L. O.....Wendall
Farrar, Geo.....Elgin
Green, Prof. S. B.....St. Anthony Park
Gerdsen, Henry.....Victoria
Grover, A. J.....Zumbrota
Gastfield, A. F.....2112 W. 2d st., Duluth
Goodman, D. E.....Faribault
Grannis, G. F.....Vernon Center
Gideon, Ansel.....Excelsior
Glazier, Aaron.....Alden
Grimes, Calvin.....Northfield
Grasswick, E. E.....Canby
Grant, John.....Linwood
Green, A. M.....Fulda
Gearty, T. G.....Robbinsdale
Gurney, C. W.....Yankton, S. D.
Graves, Mark.....Adrian
Grogan, M. F.....Dell Rapids, S. D.
Garden, Oscar.....Dassel
Glumm, H.....Redwood Falls
Greeley, Edwin.....Alden
Garver, Mrs. M. L.....Cheney
Gorman, S.....Thorpe, Wis.
Gergen, N. B.....Hastings
Gerhardt, B. M.....Raymond
Glidden, S. H.....Elk River
Gregor, John.....Hutchinson
Gordon, F. A.....Sauk Rapids
Glaeser, Jacob.....Owatonna
Gibbs, Mrs. F. H.....St. Anthony Park
Henke, H. F.....Lennox, S. D.
Henning, P. A.....Aspelund
Henning, F. A.....Apple River, Wis.
Holden, H. T.....Sunburg
Hazard, A. E.....Rushford
Hoyt, B. T.....Merriam Park
Hill, D. C.....Red Wing
Harris, D. S.....Pipestone
Hall, D. S.....2509 Colfax av. S., Mpls.
Hagen, Ole J.....Hendrum
Hayford, S. W.....Gully
Hirsch, Geo.....Austin
Hawkins, J. C.....Austin
Hogan, Walter.....Fergus Falls
Hamlin, Alonzo.....Spring Valley
Hesselgrave, R. V.....Winnebago City
Highby, L. P.....Albert Lea
Hawkins, A. O.....Excelsior
Heins, H. H.....Lydia
Heifort, E. A.....Stillwater
Hazard, Geo. H.....93 11th st., St. Paul
Hamustrom, C. J.....Sta. A., Mpls.

Hillard, Mrs. Lettie D.....Lykins, Wis.
Hughes, John S .....Box 17, Minneapolis
Hulbert, C. S .....City Hall, Mpls.
Harker, J. B.....1726 9th av. S., Mpls.
Hart, W. H. .....Owatonna
Hewitt, A .....Canby
Hotson, Atkins.....Austin
Hays, Prof. W. M.....St. Anthony Park
Howard, Harvey.....Lennox, S. D.
Hawkinson Chas.....Chowen
Hinkley, C. N .....Champlin
Haseltine, F. T .....Crookston
Heine, Herman .....Faribault
Hanson, Nels N.....Morgan
Henry, Forest .....Dover
Holbert, H.....341 Robert st., St. Paul
Hansen, L. H.....Viborg, S. D.
Hough. Jas. M.....Clear Lake, S. D.
Harrington, D. F.....Sioux Falls, S. D.
Heines, E. H.....Wakonda, S. D.
Heald, W. H. .....Letcher, S. D.
Headley, Prof .....Winnebago City
Hofer, F. .....Austin
Hart, E. W .....Madison, S. D.
Hoglund, Olaf.....720 Vineland Place, Mpls.
Histed, Peter.. .....Lyndale
Howe, E. E.. .....Brooklyn Centre
Holmer, Oscar.....Cokato
Hahn, Elias .....Owatonna
Hammer, M. E.....Heiberg
Hage, Miss Clara.....La Salle
Henze, Wm .....Lake City
Husting, L. P.....Cottage Grove
Hannulo, John.....Knapp
Hessian, Pat. .....Belle Plaine
Hutchinson, Prof. J. C .....
.....3806 Blaisdell av., Mpls.
Haberman, Fred.....Blooming Prairie
Hegland, Willie.....Moland
Holteen, H. B.....Box 315, St. Peter
Hadland, O. P.....Ostrander
Hill, C. A.....Elk River
Haggard, Henry. .....Excelsior
Hanson, A. L.....Ada
Hayes, J. M .....Lake Park
Hedstrom, Mr.....Evansville
Hensel, Ed.....New Ulm
Hoode, C. O .....Hendricks
Holmgren, Alfred.....Kerkhoven
Iverson, Elie.....Ihlen
Inglis, T. H.....Redwood Falls
Ilett, John.. .....Seaforth
Jenson, Robt. .....Bixby
Jacobson, P. G.....Madison
Johnson, P. G. .....Lake City
Jensen, Jens A.....Rose Creek
Jardine, J. B.....Parker
Jewett, E. G.....546 Selby av., St. Paul
Jorgenson, Col.....Hutchinson
Johnson, M. B.....Nieollet
Jensen, C. M.....Box 1027, Albert Lea
Jarchow, Geo.....Stillwater
Johnson, Nels E.....Grove City
Johnson, A. .....Adrian
Johnson, C. R.....Claybank
Jones, Thos. C.....Russell
Jacobson, Hon. J. F .....Madison
Kennedy, Mrs. A. A.....Hutchinson
Kelley, R. I. .....Worthing, S. D.
Kimball, F. W.....Austin
Keenan, Joseph.....Austin
Kingsley, Mrs. Ida M.....Stewart
Kingsbury, Mrs. D. L. .....
...1996 Milwaukee av., Merriam Park
Kennedy, J. W. .....Lake City
Kapphahn, Gustavus.....Alexandria
Katzner, Rev. J. B.....Collegeville
Kaer, Nels C.....2211 24th av. S., Mpls.
Kording, John.....Hayfield
Kendall, Mrs. Caroline .....St Peter
Klevann, P. P.....Starbuck
Kincade, W. S.....Sioux Falls, S. D.
Kingsbury, Rev. L. .....Sioux Falls, S. D.
Keating, Richard .....Dell Rapids, S. D.
King, W. V.....Jackson
Kovar, W.....Steele Center
Knapp, G. N.....Stanton
Koren, J. D.....Care of N. P. Ry., St. Paul
Klatt L. R .....Alexandria
Koenen, Philip.....Kasota
Keasling, Fred.....Elk River
Keays, A. W .....Elk River
Kindig, S. E.....Elgin
Kirk, E. B.....445 Laurel av., St. Paul
Key, C. L .....St. Peter
Longbittern, John.....Seaforth
Lansing, E. W.....Owatonna
Larson, John.....Murdock
Lyman, A. B .....Excelsior
Lyman, H. M.....Excelsior
Laird, John C.....Winona
Livingston, R. C.....Spring Valley
Lee, J. J .....Wastedo
Lundblad, Peter.....Markville
Loring, C. M.....102 Clifton av., Mpls.
Lyons, Wm.....2924 Clinton av., Mpls.
Leach, A. D. .....Excelsior
Longfellow, Levi....1808 Vine Place, Mpls.
Lomen, O. O .....Decorah, Ia.
Lucken, K. J.....Portland, N. D.
Lawson, F. E .....Goodhue
Leyde, G. F.....Kimball
Leibrandt, Jacob .....Jordan
Larson, L. .....Cereal
Lund, Alfred .....New Richland
Lawson, H. J. .....Owatonna
Leath, Fred.....Cleveland
Lais, H. A.....St. Killian
Leckner, Geo.. .....Redwood Falls
Lathrop, Hon. H. J.....Iowa City, Ia.
Lake, Sec'y A. H.....Black River Falls, Wis.
Lindgren, A. G.....Adrian
Long, A. G.....Excelsior
Libby, F. M .....Camden Place
Leonard, S. F.....Washington
Lysne, Ole O.....Northfield
Larkin, G. E.....Northfield
Lietz, L. .....Dover
Lord, L. P.....Owatonna
Lester, Erwin.....Elm
LeMay, J. J .....Mendota
Lietz, G.....Dover
Lee, E. R. .....Plainview
Ledell, Hendrick.....Lanesboro
Looker, R. E. .....Morristown
Lamont, Scott.....Jarretts
Little, W. F .....Lennox, S. D.
Lauritzen, A. F. T. .....
.....36th st. and Calhoun Boul., Mpls.
Lindberg, A. R.....Box 885, Brainerd
Mitchell, D. M.....Owatonna
Mack, Wm.....Bellview
Mills, L. D .....Lake Crystal
Martin, S. A.....Ashby
Mesenburg, Frank.....St. Cloud
Merritt, C. W.....Homer
Mitchell, J. L.....Austin
Murphy, R. R.....Austin
Massee, A. W.....Albert Lea
Moore, O. W.....Spring Valley
Mesenbring, Otto .....Cologne
Manderfeld, Henry.....New Ulm
Mills, R. W. .....Greenleaf
Murray, J. W.....Excelsior
Modlin, O. H. .....Excelsior
Moeser, Frank.....St. Louis Park
Mason, W. B.....Excelsior
Marsh, F. L.....Champlin
Mattson, C. G.....Lindstrom
Murray, Mrs. E. M.....Excelsior
Moyer, L. R .....Montevideo
Meder, J. F.....Pine City
Martin, W. L.....1811 Vine Place, Mpls.
Magnusson, Sven.....Stark
Maltby, Geo. E.....Redwood Falls
Moss, W. F. .....Reading
Mathiesen, H. .....Watertown, S. D.
Maxwell, Alfred.....Excelsior
Mohl, Fred .....Adrian
Mackintosh, R. S.....St. Anthony Park
Mayer, E. E.....Hudson, Wis.
Mayman, E. W. .....Sauk Rapids

Mickelson, John..... Luverne
Miner, J. R.....432 Boston Blk., Mpls.
Meyer, Henry. . ..... Blue Earth
Miller, J. H.....Huron, S. D.
Mansel, W. R..... Adrian
Marr, Wm..... Adrian
Marr, H. D..... Adrian
Maland, M. A.....Rushford
Michenor, D. K..... Etna
Moore, Geo. C.....Detroit
Maxner, Frank..... River Point
Mollenhauer, Aug.....Steele Center
Morehouse, A. S.....Watertown, S. D.
Malberg, P. B..... Viking
Myrah, E. G..... .....Spring Grove
Miller, Albert..... ..... Cannon Falls
Mattson, Nels.....Cannon Falls
Miller, F. C..... .....Cannon Falls
Melgaard, H. I, ... Argyle
Menwissen, Henry..... .. Cologne
Miller, S. O.. .....Eidswold
Marzahn, F ..... Waterville
Merrill, Geo. L ..... Ecklund
Morgan, Erastus. ..... .Elk River
Martens, Mrs. H. H.. ..... Elk River
Mills, Mrs J. S. .....Elk River
Malcolm, Wm..... Worthington
Minnesota Training School..... Red Wing
Morgan, C.....Spring Valley
Morgan, J. T.....Forestville
Moss, Henry..... Nerstrand
Mills, W. T.....Eden Valley
Miller, E. B .. ..Bloomington
Mull, Mrs. W. H.....White Bear Beach
Morris, S. W ..... Station 5, Mpls.
Manship, W. C.....304 Nelson av., St. Paul
Mills, W. E. L.....Lac qui Parle
McPheeters, R. S.....Hay Point
McLennan, Thos. ..... Belmont, Man.
McKenzie, Mrs. Anna .....Hutchinson
McKisson, G. D.... .....Charles City, Ia.
McCulley, M. P..... ....Maple Plain
McRostie, Mrs. J. H..... .....Owatonna
McLean, F. E..... Adrian
McNee, J. H.....Spring Valley
McHugh, M..... Hastings
McWade, W. S..... Excelsior
McBeath, A. C.....Elk River
McKee, Geo .... Tenney
McTaggart, D. L.....Campbell
Nilsaen, Robt..... Evan
Nelson, M. O... .....4260 Park Blvd., Mpls
Nelson, H. P..... .....Montevideo
Nelson, C. N..... .....Amo
Nitzsche, Julius .....Fulda
Nordine, John.....Lake City
Nielson, Geo. .....Danewood
Nutter, F. H .....Sykes Blk., Minneapolis
Naylor, W. F.....Wrightstown
Nielson, John ... .Ortonville
Nelson Hans .....Box 1228, Fergus Falls
Nelson, Geo. H..... .....Titonka, Ia.
Noyes, W. H..... ... Owatonna
Norby, A.....Madison, S. D.
Nelson, M. O.. .....Hartland
Newell, Dr. T. G..... Adrian
Nelson, H. T..... .....Cokato
Nicol, Frank .....Lander, Wyo.
Norelius, Fred..... Luverne
Noble, W. P.....Luverne
Ness, J. P. .... Constance
Norby, J. C..... ..... Ada
Nyberg, Mrs. Hattie.....Lintonville
Oleson, Michael. .....Wegdahl
Older, C. E..... ...Luverne
Owen, S. M .....Lumber Exch., Mpls.
Ogilvie, Sr., James ....Blue Earth
Olsen, J. W..... Albert Lea
Orton, Chas. J. .... Marietta
Ongstad, Hans A.,.....Pelican Rapids
Oslund, Nicholas..... ..... Bethel
Oppegaard, E. O..... ..Sacred Heart
O'Brien, Tim..... ..... Adrian
Otterness, E. L.... .....Wastedo
Osborn, John... .... Dassel
Omland, Erik.....McIntosh

Parker, W. L.....Farmington
Pfaender, Jr ,Wm..... ..... New Ulm
Poussin, G. W..... . .....White Earth
Parks, J. S.. .....Pleasant Mounds
Peck, E. F.....Austin
Payne, S. D .....Kasota
Palmer, W. A..... . ... Hetland, S. D.
Pracna, F. J..... ..117 Main st. S. E., Mpls.
Pendergast, W. W.....Hutchinson
Phelps, G. H..... .....Mapleton
Pond, E. R .....Bloomington
Penning, M. .... Sleepy Eye
Penney, John..... .....Cushing, Wis.
Pond, H. H..... ..... Bloomington
Perry, P. H.....Excelsior
Peterson, F. J..... Waconia
Perry, G. S.....Farmington
Peake, A. G..... .... Sanborn
Peterson, Jos ....Lake Crystal
Prosser, L. W..... Le Roy
Pfister, J. M. .....Marietta
Petterson, M..... ... Willmar
Parkhill, R ..... Chatfield
Partridge, N. O ... . Owatonna
Platts, A. W..... Egan, S. D.
Patten, A. W..... ....West Concord
Powers, T. S..... ..... Grand Rapids
Pike, E. Z .... Medford
Peterson, P. H..... Lanesboro
Pingilly, Jos..... .. .. Shakopee
Phipps, E. W.....3901 Penn av. N., Mpls.
Parks, W. S..... Thorp, Wis.
Paul, E. B. .....Worthington
Pickle, A. H..... Sleepy Eye
Peterson, Jno. Alf .....Box 67, Chisago City
Payne, E. E ..... Northfield
Powell, F. M. .....Glenwood, Ia.
Phoenix, F. S.. .....Bloomington, Ill.
Pope, Jed. ..... Caledonia
Powell, Oscar .... Lake City
Pettijohn, L. W..... Minnetonka
Palmer, W. H.....Brownsdale
Pickert, C. J..... St. Charles
Powell, L. ....Amo
Prattland, M. A..... ..... Ada
Phillips, W. B ..Grand Portage Reservation
Peterson, O. M..... .....Albert Lea
Phillips, C. N..... Echo
Potts, W. J..... Brown's Valley
Pardee, W. S..... ....City Hall, Mpls.
Peterson, J. G..... ..Kensington
Potter, L. B.....Springfield
Purdy, G. H ....Mason City, Ia.
Perkins, T. E.....Red Wing
Quimby, H. B..... .....Fairpoint
Reed, A. H.. ..... Glencoe
Rowell, H. H. S....Care of "Progress", Mpls.
Romo, Ludvig..... Aspelund
Redpath, Thos ..... Wayzata
Robertson, Prof. Wm.....St. Anthony Park
Rothie, O. P..... Moland
Reeves, Vincent ..... Champlin
Rowe, Charles. .... Hewitt
Robinson, Marshall...640 R. 19th st., Mpls.
Ricks, J. R .... Long Lake
Revier, Chas..... St. Peter
Ryan, T... .....Robbinsdale
Rynda, A..... .....Canby
Romer, Fred..... Albert Lea
Reed, S. J ....Webster, S. D.
Rogers, E. S .....3620 Nicollet av., Mpls.
Renton, John .....Deloraine, Man.
Rendler, C. M..... 568 Ohio st., St. Paul
Robbins, C. R.... ..124 Iglehart st., St. Paul
Richardson, W. H.. ... Webster City, Ia.
Ruff, Mrs. DeWitt..732 Globe Bldg., St. Paul
Ritter, C. H ....Plainview
Randall, Supt. F. L.....St. Cloud
Robie, H. P..... Sioux Falls, S. D.
Rummel, Henry... .....Sioux Falls, S. D.
Rutherford, Wm. H. A.....McIntosh
Reinke, F. H.....Fairmont
Rucker, Ed.. ..... Delhi
Richards, J. H.....Buffalo
Rogers, W. P.....Excelsior
Rudquist, And..... Knapp

Ringle, Joe..... Hurley, S. D.
Richard, David..... Shakopee
Ranney, E. C..... Waseca
Riley, E. H. . ..... Box B, St. Cloud
Radabaugh, N. C....2438 24th av. S., Mpls.
Ring, Chas. O..... Lennox, S. D.
Roll, H. L..... Madelia
Roberts, J. A. ..... St. Peter
Swenson, Albert..... Chisago City
Smith, R. W. ..... Lake Park
Spickerman, Robt.... ..... Fergus Falls
Stubbs, Rolla..... Bederwood
Sawyer, O. W..... Excelsior
Swan, J. W ..... White Bear
Secor, David..... Winnebago City
Snyder, C. E..... Preston
Sargent, C. A..... Red Wing
Skotterud, E. O..... Dawson
Smith, S. B ..... Foreston
Schiebe, Chas.. ..... Golden Valley
Shepherd, A. M.....
.. Bloomington and 47th st. S., Mpls.
Shaw, O. W ..... Austin
Street, A. H. ..... Albert Lea
Severson, Frank L..... Stewartville
Smith, Mrs. Geo..... Madison
Schwamm, John ..... Rose Creek
Scott, W. G..... Winnipeg, Man.
Scott, J. W..... Austin
Selvig, C. C..... Willmar
Smith, L. Z..... Mankato
Smith, T. C..... Lakeville
Stoft, Jacob..... 1007 Wash. av. S., Mpls.
Simonson, Hon. H..... 225 Cedar av., Mpls.
Sampson, C. W..... Excelsior
Sprague, Mrs. L. E. P.....
..... 324 Union st. S. E., Mpls.
Smith, Lyman..... Long Lake
Stellar, G. F..... Excelsior
Spates, S. R. ..... Markville
Swenson, C. E..... Chisago City
Siverts, P..... Canby
Sorenson, S..... Buena Vista
Shier, Thos. ..... Kasson
Stanley, D. B..... Maine Prairie
Sanderson, H. A..... Anoka
Steffens, Ephraim..... Spring Valley
Steffens, C. H..... Grand Meadow
Sundberg, Chas. A..... Worthington
Stewart, Robt. ..... Redwood Falls
Shadbolt, Frank..... Caledonia
Smith, A. E ..... Austin
Sackett, D. P..... Fairmont
Swenson, Solomon..... Winthrop
Searle, Dr. A. C ..... Owatonna
Sullivan, M. D., Thos..... Springfield
Simmons, H. L..381 8th av. S., Fargo, N. D.
Swann, Mrs. D. A..... Mankato
Semler, J. F. ..... Staples
Simpson, Judge D. F.....Court-House, Mpls.
Stetson, J. B..... Hawley
Seelye, H. A..... Preston
Skartvedt, G..... Canton, S. D.
Stuart, W. A..... Sturgis, S. D.
Slade, Geo..... Adrian
Shaw, G. I..... Rushmore
Scherlie, H. A..... Dundee
Schuldt, John ..... Meriden
Steffens, O. R..... Racine
Stifter, Stephen..... Cokato
Shaver, Clark..... Redwood Falls
Stenger, Rev. P. Stephen..... Selz, N. D.
Shelso, T. O..... Brooten
Share, J. O..... Albert Lea
Street, Henry... ..... Hebron, Ill.
Saxou, Chas..... Worthington
Spicer, S. E..... Watertown, S. D.
Sandrock, Wm..... Rushford
Sylling, H. A..... Spring Grove
Schech, M. J..... Sheldon
Sorg, Michael..... Hastings
Saterburg, John..... Lamson
Sartelle, Mrs. Jos..... St. Cloud
Schaumberg, J. H..... Sanborn
Smith, Chas. W..... Lake Park
Sands, Geo..... Aspelund

Sherman, H. W..... Excelsior
Suchaneck, J. W..... Owatonna
Simondat, J. H..... North Redwood
Sparrow, Harry..... Kasson
Simmons, Harold..... Howard
Stout, W. H. ..... Champlin
Sprung, H. F..... Ada
Shay, John..... Malden, Mo.
Snyder, Fremont..... Freeborn
Schain, O. P..... Hoyt
Smith, J. M..... East Chain
Sickle, Hans..... Pilot Mound
Schotzka, F. E..... Springfield
Sartell, Mrs. Fred..... St. Cloud
Swenson, G..... Norway Lake
Smith, Thos. Tunis .....Box 2337, St. Paul
Smith, L. W..... Box 2337, St. Paul
Sear, W. F ..... Dawson
Strand, I. E..... Boyd
Salter, Miss C. E..... Victoria
Shaw, Prof. Thos..... St. Anthony Park
Schmidt, C. A..... Owatonna
Snydam, Jas ..... 429 Holly av., St. Paul
Solem, Rev. O. A. Th... ..... Halstad
Smith, W. H..... Farmington
Sherwin, W. B..... Ostrander
Taylor, G. D..... Fulda
Thorson, Thos ..... Canton, S. D.
Town, Mrs. F. L..... Lakeland
Taubert, M. C..... North Redwood
Taylor, James..... Austin
Tracy, G. A..... Watertown, S. D.
Tanner, Wm..... Cannon Falls
Tracy, E. F..... 713 25th av. N. E., Mpls.
Turnbull, John..... La Crescent
Tew, D. J..... Rushford
Tingley, W. J..... Stillwater
Teachout, G. M..... 1506 4th av. S., Mpls.
Taylor, W. L..... Howard Lake
Tucker, F. D..... St. Anthony Park
Theis, E. C..... Austin
Tollefson, Mrs. Thos..... Houghton, S. D.
Tomalin, W. H..... Kildonan, Man.
Thomas, J. W..... Osakis
Teigland, J. L..... Minneota
Tobias, Geo. L..... Redwood Falls
Tibbitts, F. J..... Delhi
Thompson, H. F..... Boissevain, Man.
Thompson, C. M..... Adrian
Tupper, B. F ..... Dundas
Tanner, U..... Cannon Falls
Taylor, S. P..... Little Valley
Tyler, J. G ..... Hartford, S. D.
Todd, S. C..... 517 Lyndale av. N., Mpls.
Thier, Bernard..... Lismore
Trenham, N. J..... Alexandria
Upton, J. H..... Cresco, Ia.
Underwood, L..... Plainview
Van Hoesen, F. B..... Alexandria
Vollenweider, Carl..... La Crescent
Van Vliet, H. B..... Farmington
Vilwock, Wm..... Owatonna
VanLoon, John..... Box 813, LaCrosse, Wis.
Varley, Mrs. Jessie..... Clear Lake
Wilfert, Andrew..... Cleveland
Widmoyer, W. S..... Dresbach
Wampler, A. J..... White Bear
Ware, Eugene ..... Clinton Falls
Wittman, Aug..Fairview & Otto av., St. Paul
Walker, J. C..... Chico, Cal.
Wright, A. N..... Owatonna
Wedge, Clarence . . .. Albert Lea
Warrant, J. W..... Kasota
Witte, H. L. F..... 629 5th st. N., Mpls.
Weld, J. O..... Mound
Wessinger, Wm.....
.....Fairview & St. Claire av., St. Paul
White, Miss Emma V. 818 Nicollet av., Mpls.
Winter, O. O.....
Williams, F. J ..... Rush City
Woodbury, Ed..... Barnum
Wachlin, Wm..... Faribault
Wiedenmann, Otto..... New Ulm
Wilwerding, Anton..... Freeport
West, J. P... ..... Hastings
Wood, Jos..... Windom

Weld, F. E.....Rockford
Walz, Michael.....Perham
Wells, J. R.....Herman
Walden, J. M.....Northfield
Whiting, Geo. H.....Yankton, S. D.
Wicklund, John.....Kandiyohi
Wilcox, I.....Winnebago City
Winter, A. B.....Redwood Falls
Wilde, A. J.....Sexton, Ia.
Wood, S. T.....Rushmore
Wilford, M. C.....Canton
Whetstone, Dr. Mary S.....408 Nicollet av., Mpls.
Wanous, John.....Pratt
Walrath, H. D.....Watertown, S. D.
Wagner, J. S.....Millerville
Wirt, Jacob.....Lewiston
White, J. H.....Crystal
Weaver, Wm.....West Concord
Widger, Geo. R.....Chatfield
Webb, H. L.....Glyndon
Weber, Rev. B.....Salem, S. D.
Weise, Ed.....New Richland
Worrell, C. E.....Zimmerman
Williams, J. R.....Elgin
Windmiller, Fr.....Mankato
Wilkinson, A.....Newport
Wilcox, A. N.....3035 15th av S. Mpls.
Wills, R. C.....Dassel
Wilson, D. R.....Mankato
Williams, D. L.....Viola
West, Miss Martha D.....2239 Gordon av., St. Paul
Wendling, J.....Eden Valley
Wilson, Wm. A.....Brown's Valley
Wilson, Andrew.....Tenney
Weiland, R. G.....Hutchinson
Williams, W. N.....Elbow Lake
Wolf, Simon.....Nerstrand
Warner, H. C.....Forestburg, S. D.
Yahnke, Frank.....Homer Road, Winona
Younger, M. A.....Nelson

LIFE MEMBERS.

Adams, J. L.....Glenwood
Cummins, J. R.....Washburn
Clark, Chas. B.....1513 Bryant ave. N., Mpls.
Danforth, Wm.....Red Wing
Dartt, R. M.....Owatonna
Dedon, W. S.....Taylor's Falls
Dickerson, Wm, L.....Richland, S. D.
Doughty, J. Cole.....Lake City
Dunwoody, Wm. H.....52 S. 10th st., Mpls.
Evans, Sheldon J.....LaCrescent
Gardner, Chas. F.....Osage, Iowa
Gjemse, L. J.....Hader
Hagen, O. W.....Sleepy Eye
Harris, E. E.....Galesville, Wis.
Harris, F. I.....LaCrescent
Hartwell, J. L.....Dixon, Ill.
Hawley, T. C.....Lake Park
Hobart, A. W.....1412 W. 36th st., Mpls.
Hoverstad, T. A.....Crookston
Howard, J. A.....Hammond
Jerabek, J. S.....Silver Lake
Jewett, R. H. L.....Capitol, St. Paul
Johnson, Gust.....Excelsior
Larson, C. L.....Winthrop
Loring, A. C., 202 Clifton ave., Minneapolis
Loose, E. C.....Steen
Manda, W. A.....Short Hills, N. J.
Manning, W. H., 1146 Tremont Bldg., Boston, Mass.
Macaulay, T. B.....Montreal, Canada
Melinat, Rev. M.....Webster
Mo, Hans.....Sleepy Eye
Nagel, Eggert.....1118 W. Lake st., Mpls.
Nelson, A. A., Jr.....Atwater
Nehring, Edw.....Stillwater
Nussbaumer, Fred.....St. Paul
Poore, Hamlin V.....Bird Island
Randall, E. W.....Hamline
Scott, Rev. W. T.....Morristown
Scranton, Ellsworth.....Montrose
Sherman, E. M.....Charles City, Iowa
Schaupp, Chas. F.....Hart
St. John, B. E.....Fairmont
Stager, Mrs. Jennie.....Sauk Rapids
Strand, G. W.....Taylor's Falls
Swanson, Aug. S.....St. Paul
Terry, Alfred.....Slayton
Thompson, Mrs. Ida.....Glen Avon, Duluth
Trow, A. W.....Glenville
Underwood, Mrs. Anna B.....Lake City
Underwood, Roy.....Lake City
Warren, W. T.....Woodstock
Wheeler, C. P.....602 Oneida Blk., Mpls.
Wheaton, D. T.....Morris
Wright, R. A.....Eureka

HONORARY LIFE MEMBERS.

Bass, J. G.....Hamline
Bowen, Mrs. Jas.....327 Beacon st., Mpls.
Budd, Prof. J. L.....Ames, Iowa
Bush, A. K.....Dover
Brand, O. F.....Faribault
Coleman, N. J.....St. Louis, Mo.
Corp, Sidney.....Hammond
Dartt, E. H. S.....Owatonna
Day, Ditus.....Farmington
Elliot, Wyman, 815 E. 18th st., Minneapolis
Ford, L. M.....San Diego, Cal.
Gaylord, Edson.....Nora Springs, Iowa
Grimes, J. T.....3209 Nicollet ave., Mpls.
Gibbs, Oliver.....Prescott, Wis.
Hansen, Prof. N. E.....Brookings, S. D.
Kenney, S. H.....Morristown
Knapheide, Rudolph.....St. Paul
Kramer J. C.....LaCrescent
Lacy, Chas. Y.....Longbeach, Cal.
Luedloff, Chas.....Cologne
Latham, A. W.....207 Kasota Blk., Mpls.
Lord O. M.....Minnesota City
Manning, J. W.....Reading, Mass.
Manning, Mrs J. W.....Reading, Mass.
Mendenhall, R. J.....Minneapolis
Oxford, Wm.....Freeburg
Paist, Mrs. Wm.....Sioux City, Iowa
Patten, C. G.....Charles City, Iowa
Phoenix, F. K.....Delavan, Wis.
Richardson, S. D.....Winnebago City
Smith, Truman M.....San Diego, Cal.
Sias, A. W.....Harbor View, Fla.
Smith, C. L.....Bemidji
Sargeant, Mrs. H. B.....Lake City
Somerville, Wm.....Viola
Stewart, Amasa.....Lamarque, Tex.
Tuttle, A. G.....Baraboo, Wis.
Tilson, Mrs. Ida E.....West Salem, Wis.
Underwood, J. M.....Lake City
Van Cleve, Mrs. C. O., 603 5th st. S. E., Mpls.

HONORARY MEMBERS FOR 1901.

Watrous, C. L.....Des Moines, Iowa
Thomas, John W.....Minneapolis
Stevenson, A. P.....Nelson, Man.
Trigg, J. S.....Rockford, Iowa
Goff, Prof. E. S.....Madison, Wis.
Waldron, Prof. C B.....Fargo, N. D.

LIFE MEMBERS DECEASED IN 1901.

Wm. Mackintosh.....Langdon
John S. Harris.....LaCrescent
H. W. S. Cleveland.....Chicago

INDEX.

A

Agricultural Society, Minn., State, Annual Meeting, 1901, Oliver Gibbs.. 65
Agricultural Society, Minn. State, Annual Meeting, 1901, Oliver Gibbs.. 65
Akin, D. F., Apples for Central Minnesota..... 151
Alderman, Mrs. L. A., Varieties of Apples Adapted to South Dakota.... 377
Allen, Col. W. B., A Lumberman's View of the Forestry Situation..... 248
American Pomological Society, Delegate's Report, Prof. S. B. Green.... 391
Andrews, J. P., Nursery Culture of the Apple..... 331
Annual Meeting, 1900, Journal of..... 481
Annual Meeting, 1900, Minnesota State Horticultural Society, F. H. Nutter 3
Apples Adapted to South Dakota, Varieties of, Mrs. L. A. Alderman.... 377
Apples Best Adapted to Southern Minnesota, Wm. Somerville..... 147
Apples for Central Minnesota, Varieties of, D. F. Akin..... 151
Apples for Southern Minnesota, F. W. Chapman..... 147
Apples, Gathering, Handling and Packing Transcendant, J. T. Grimes.... 259
Apples, J. S. Trigg..... 138
Apple, Nursery Culture of the, J. P. Andrews..... 331
Apple, Report of Committee on Award of $5,000 Premium for Seedling, Prof. S. B. Green..... 109
Apple, Walker's Seedling..... 184
Apple, Wilford's Winter Seedling..... 423
Asparagus Rust, Prof. S. B. Green..... 72
Ayres, H. B., Wood Paper Industry..... 403

B

Bees and Horticulture, Eugene Secor..... 455
Beekeepers and Horticulturists, Something of Interest to, A discussion... 404
Beekeepers' Association, Minnesota, Annual Meeting, 1900, L. D. Leonard 73
Bees for Fertilization, Keeping, A discussion..... 409
Biography, Ex-Secretary Oliver Gibbs..... 41
Biography of Chas. Y. Lacy..... 1
Biography of Edson Gaylord..... 81
Blackberries, Currants and Gooseberries for Minnesota, A. O. Hawkins.. 420
Blackberry Culture, Rolla Stubbs..... 353
Blair, C. L., Laying out the Orchard and Planting the Trees 424
Blair, C. L., My Duchess Orchard..... 214
Brainerd, Sec., Mrs. Charles, Annual Meeting, Southern Minnesota Horticultural Society 20
Brown, Mrs. H. F., Our National Flower..... 384

C

Campbell Subsoil Packer in Southwest Minnesota, The, O. C. Gregg..... 343
Cashman, Thos. E., Laying out the Small Fruit Farm; General Principles Involved 173
Chapman, F. W., Apples for Southern Minnesota..... 147
Chapman, H. H., Small Fruits in Northeastern Minnesota..... 348
Chapman, H. H., The Tale of the Rings..... 429
Clematis Coccinea, Prof. S. B. Green..... 411
Committees, Standing, 1901..... 7
Compass Cherry, The, O. W. Moore..... 358
Cook, Dewain, Annual Meeting, South Dakota State Horticultural Society 104

Cook, Dewain, Manipulation of Soil Necessary for a Plum Orchard..... 215
Cook, Dewain, Report Windom Trial Station..... 265
Cook, Supt., Dewain, Windom Trial Station..... 61
Crab and Other Trees, The Greenwood, E. H. S. Dartt..... 356
Crabs for Minnesota, Varieties of, Ditus Day..... 434
Crab, The Minnesota, A discussion..... 208
Crafts, M. D., Leo M., Wisdom of National Park Movement..... 303
Crimson Rambler Rose, The..... 473
Crossing, A Suggestion in, Edson Gaylord..... 383
Cross, Judson N., Obituary..... 400
Cross, Judson N., Portrait of, Frontispiece ....Opp. 400
Cummins, J. R., Growing Half-Hardy Fruits..... 354
Currant and Gooseberry Plantation, Laying Out and Setting the, C. E. Older 233
Cutler, M., What to Plant with the Strawberry, Raspberry and Blackberry 277

D

Danforth, Miss Lucia E., Country School Grounds..... 226
Dartt, E. H. S., A Very Interesting Family of Tetofsky Seedlings..... 408
Dartt, E. H. S., Dartt's Hybrid..... 234
Dartt, E. H. S., The Duchess Orchard..... 185
Dartt, E. H. S., The Greenwood Crab and Other Trees..... 356
Dartt's Hybrid, E. H. S. Dartt..... 234
Dartt's Park at Owatonna..... 130
Day, Ditus, Varieties of Crabs for Minnesota..... 434
Draining of Marsh Land and its Use in Gardening, W. L. Taylor..... 189
Drain Tile in the Garden and Orchard, The Use of, R. A. Wright..... 143
Duchess Orchard, The, E. H. S. Dartt..... 185
Dust Mulch in Minnesota, The, W. W. Pendergast..... 463

E

Eklof, John, Treatment of the Strawberry Field after Plowing and before 355
Elliot, Wyman, Annual Report of Executive Board..... 14
Elliot, Wyman, Annual Report of Legislative Committee..... 16
Elliot, Wyman, Report of Committee on Gideon Seedlings..... 33
Elliot, Wyman, Tracing the Gideon Seedling Apple Trees..... 31
Elliot, Wyman, Varieties of Plums for Minnesota..... 132
Endsley, P. M., Irrigation in the Minnesota Garden and Orchard..... 223
Evergreens from Seed, Growing, Clarence Wedge..... 310
Evergreens in Mower County, Jens A. Jensen..... 391
Evergreens, Transplanting and Care of, Prof. C. B. Waldron..... 219
Executive Board, Annual Report of, Wyman Elliot..... 14
Executive Board, 1901, Record of..... 497
Experiment Station in the Far Northwest, Prof. S. B. Green..... 396

F

Farrar, F. F., Varieties of Strawberries for Minnesota..... 231
Flower Buds of our Fruit Trees, The, Prof. E. S. Goff..... 124
Flowers, My Annual, Wm. Tomlinson..... 87
Flowers, The Army of, J. T. Grimes..... 288
Forestry Situation, Lumberman's View of the, Col. W. B. Allen..... 248
Freeman, Jonathan, Southern Minnesota Horticultural Society..... 412
Freeman, Miss Lena M., Personal Reminiscences of a Farmer's Fruit Garden 445
Frontispiece, Chas. Y. Lacy.....Opp. 1
Frontispiece, Portrait of Oliver Gibbs.....Opp. 41
Frontispiece, Portrait of Edson Gaylord.....Opp. 81
Frontispiece, Portrait of Wm. Mackintosh..... .....Opp 121
Frontispiece, Portrait of John S. Harris.....Opp. 161
Frontispiece, Home of John S. Harris.....Opp. 201

Frontispiece, Lyman's Prolific Crab, Original Tree....Opp. 241
Frontispiece, Portrait of Prof. Otto Lugger....Opp. 281
Frontispiece, Strawberry Plantation of W. E. Fryer....Opp. 321
Frontispiece, Horticulture at the Minnesota State Fair, 1901....Opp. 361
Frontispiece, Portrait of Capt. Judson N. Cross....Opp. 401
Frontispiece, Agricultural Hall at Minnesota State Fair.... 441
Fruit Garden, Personal Reminiscences of a Farmer's, Miss Lena M. Freeman 445
Fruit in Manitoba, A. P. Stevenson.... 141
Fruit List, 1901 10
Fruits from Seed, Propagating New Varieties of Tree, C. G. Patten.... 191
Fruits from Seed, Propagating New Varieties of Tree, C. L. Watrous.... 432
Fruits, Growing Half-Hardy, J. R. Cummins.... 354
Fruits, The Breeding of Northwestern, Prof. N. E. Hansen.... 75

G

Gardner, C. F., Profit in Horticulture. Will it Pay Here?.... 415
Gaylord, Edson, A Suggestion in Crossing.... 383
Gaylord, Edson, Biography of,.... 81
Gaylord, Edson, Portrait of, Frontispiece....Opp. 81
Gaylord, Edson, Valuable Facts.... 312
Gibbs, Oliver, Annual Meeting, Minnesota State Agricultural Society, 1901 65
Gibbs, Oliver, Biography 41
Gibbs, Oliver, Portrait of, Frontispiece....Opp. 41
Gibbs, Oliver, The Gideon Memorial Fund.... 24
Gideon Memorial Fund, Subscriptions to.... 29
Gideon Memorial Fund, The, Oliver Gibbs.... 24
Gideon Seedling Apple Trees, Tracing the, Wyman Elliot.... 31
Gideon Seedlings, Report of Committee on, Wyman Elliot.... 33
Ginseng Culture, H. Simmons.... 185
Ginseng, Culture of American.... 437
Goff, Prof. E. S., The Flower Buds of Our Fruit Trees.... 124
Gooseberry and Currant Plants, Growing, Geo. W. Strand.... 203
Grapes Adapted to Minnesota, Gust Johnson.... 357
Grapes Best Adapted to Minnesota, Varieties of, J. W. Murray.... 205
Green, Prof. S. B., American Pomological Society Delegate's Report.... 391
Green, Prof. S. B., Asparagus Rust.... 72
Green, Supt., S. B., Central Station, St. Anthony Park.... 45
Green, Prof. S. B., Clematis Coccinea.... 411
Green, Prof. S. B., European Nurseries.... 94
Green, Prof. S. B., Experiment Station in the Far Northwest.... 395
Green, Prof. S. B., Report of Committee on Award of $1,000 Premium for Seedling Apple.... 109
Green, Prof. S. B., Report Central Trial Station.... 262
Green, Prof. S. B., Sun-Scalded Soft Maple.... 350
Green, Prof. S. B., Syringa Columbiana.... 454
Green, Prof. S. B., Syringa Japonica.... 306
Gregg, O. C., The Campbell Subsoil Packer in Southwest Minnesota.... 343
Grimes, J. T., Gathering, Handling and Packing Transcendant Apples.. 259
Grimes, J. T., The Army of Flowers.... 288
Gurney, C. W., Commercial Strawberry Culture.... 321

H

Hall, Opening of the New Horticultural, Boston.... 301
Hamlin, Mrs. Condé, Outdoor Improvement Work of Civic League of St. Paul 293
Hansen, Prof. N. E., The Breeding of Northwestern Fruits.... 75
Harris, John S., Home of, Frontispiece....Opp. 201
Harris, J. S., In Loving Memory of.... 160
Harris, John S., In Memoriam.... 161
Harris, John S., Portrait of, Frontispiece....Opp. 161

Harris, J. S., Close Planting of Trees..... 136
Harris, J. S., Methods of Mulching and Their Comparative Value..... 326
Harris, J. S., Report of Committee on Obituary..... 117
Harris, J. S., Resolutions in Memory of..... 271
Harris, J. S., Seedlings in 1900..... 201
Harris, J. S., Some Lessons of the Year 1900..... 284
Harris, Supt., J. S., La Crescent Trial Station..... 50
Harris, Supt., F. I., La Crescent Trial Station..... 472
Hawkins, A. O., Blackberries, Currants and Gooseberries for Minnesota 420
Hays, Prof. W. M., Agriculture in Our Rural Schools..... 253
Hays, Prof. W. M., In Memory of Dr. Otto Lugger..... 281
Higbie, W. S., Handling and Care of Nursery Stock..... 110
Home Grounds, Etc., Effective Improvement on the, Roy Underwood.... 385
Horticulture at the 1901 Minnesota State Fair, Frontispiece.....Opp. 361
Horticulture at the Prospective St. Louis Exposition..... 473
Horticulture, Will it Pay Here? Profit in, C. F. Gardner..... 415
Hoverstad, T. A., Annual Meeting, Western Horticultural Society..... 165

I

In Loving Memory of John S. Harris..... 160
In Memoriam, Dr. Otto Lugger, Willet M. Hays..... 281
In Memoriam, John S. Harris..... 161
Iowa State Horticultural Society, Annual Meeting, 1900, Prof. Wm. Robertson 70
Irrigation, C. W. Spickerman..... 418
Irrigation in the Minnesota Garden and Orchard, P. M. Endsley..... 223

J

Jensen, Jens A., Evergreens in Mower County..... 391
Johnson, Gust, Grapes Adapted to Minnesota..... 357
Journal of Annual Meeting, 1900..... 481

K

Keays, A. W., Laying Out and Planting the Strawberry Field..... 177
Keays, Supt., A. W., Meadow Vale Trial Station..... 63
Keays, Sec., A. W., Annual Meeting, Meadow Vale Horticultural Club.. 37
Kennedy, Mrs. A. A., Vice-President's Report, 1900, Third Cong. Dist.. 91
Kimball, F. W., Spraying Fruit Trees..... 379
Kimball, F. W., Vice-President's Report, 1900, First Cong. Dist..... 89
Klevann, P. P., My Scotch Pine Windbreak..... 146
Kramer, J. C., Originating New Varieties of Small Fruit,..... 351

L

Lacy, Charles Y., Biography of..... 1
Lacy, Charles Y., Portrait of, Frontispiece.....Opp. 1
Latham, A. W., Horticulture at the State Fair..... 361
Latham, A. W., Secretary's Annual Report, 1900..... 16
Latham, A. W., Secretary's Corner,.. .....38, 79. 119, 158. 199. 237. 278, 318. 359. 399. 439. 479
Leach, A. D., My Way of Laying out the Vineyard and Planting the Vines 417
Legislative Committee, Annual Report of, Wyman Elliot..... 16
Leonard, L. D., Annual Meeting, Minnesota Bee-Keepers' Association, 1900 73
Lord, O. M., Report of Minnesota City Trial Station 263
Lord, O. M., Supplementary Plantings in Orchards, and Their Rotation 97
Lord, Supt., O. M., Minnesota City Trial Station..... 54
Lugger, Prof. Otto, Portrait of, Frontispiece.....Opp. 281
Lugger, Prof. Otto, Resolutions in Memory of..... 272
Lyman's Prolific Crab, Original Tree, Frontispiece.....Opp. 241
Lyman, Supt., H. M., Excelsior Trial Station..... 49
Lyman, H. M., Treasurer's Annual Report..... 19

M

Mackintosh, Wm., Obituary of..... 121
Mackintosh, Wm., Portrait of, Frontispiece.....Opp. 121
Massee, Mrs. A. W., How to Improve and Beautify the Farm Yard..... 448
Meadow Vale Horticultural Club, Annual Meeting, A. W. Keays, Sec'y.. 37
Members, Honorary 504
Members, Life 504
Members, List of Annual, 1901 499
Merritt, C. W., Rotation on Small Fruit Farm..... 112
Minnesota State Forestry Association, Annual Meeting, 1900, Geo. W. Strand, Secretary 22
Moore, O. W., The Compass Cherry..... 358
Moyer, Supt., L. R., Montevideo Trial Station..... 55
Mulching and Their Comparative Value, Methods of, J. S. Harris..... 326
Murray, J. W., Varieties of Grapes Best Adapted for Minnesota..... 205

N

National Flower, Our, Mrs. H. F. Brown..... 384
Northeastern Iowa Horticultural Society, Annual Meeting, 1900, E. F. Peck 66
Nurseries, European, Prof. S. B. Green..... 94
Nursery Stock, Etc., Handling and Care of, W. S. Higbie..... 110
Nutter, F. H., Annual Meeting, Minnesota State Horticultural Society, 1900 3

O

Obituary, Committee on, J. S. Harris..... 117
Obituary, Judson N. Cross..... 400
Obituary of Wm. Mackintosh..... 121
Officers, 1901 6
Older, C. E., Laying Out and Setting the Currant and Gooseberry Plantation 233
Orchard and Planting the Trees, Laying Out the, C. L. Blair 424
Orchard, My Duchess, C. L. Blair..... 214
Orchards and their Rotation, Supplementary Plantings in the, O. M. Lord 97
Orchards for the Northwest, Commercial, J. S. Trigg..... 241
Outdoor Improvement Work of Civic League of St. Paul, Mrs. Condé Hamlin 293

P

Park at Owatonna, Dartt's..... 130
Parks, J. S., Report Pleasant Mounds Trial Station..... 264
Parks, Supt., J. S., Pleasant Mounds Trial Station..... 59
Park Movement, Wisdom of National, Leo M. Crafts, M. D..... 303
Patten, C. G., Propagating New Varieties of Tree Fruits from Seed..... 191
Peck, E. F., Annual Meeting, Northeastern Iowa Horticultural Society, 1900 66
Peck, E. F., Growing Strawberry Plants for Re-Setting..... 299
Pendergast, W. W., Annual Meeting, Wisconsin State Horticultural Society 101
Pendergast, W. W., President's Annual Address..... 11
Pendergast, W. W., Improving Trees and Plants..... 441
Pendergast, W. W., The Dust Mulch in Minnesota..... 463
Penning, Martin, My Experience with Plums..... 166
Penning, Martin, Plum Orcharding..... 99
Plant Food for Horticultural Crops, Prof. Harry Snyder..... 425
Plowing as a Preparation for Planting Fruits, Methods of, Prof. Wm. Robertson 168
Plum Culture, L. Z. Smith..... 421
Plum, Miner, A discussion..... 208

Plum Orchard, Handling the Trees and Planting, Laying out the, Aug. Wittmann 172
Plum Orcharding, Martin Penning..... 99
Plum Orchard, Manipulation of Soil Necessary for a, Dewain Cook..... 215
Plums for Minnesota, Varieties of, Wyman Elliot..... 132
Plums, My Experience with, Martin Penning..... 166
Premiums Awarded at the 1901 Minn. State Fair on Fruits and Flowers.. 366
Premiums, Award of, Annual Meeting, 1900..... 8
Premiums on Fruit and Flowers, Minn. State Fair, 1901, List of..... 313
Premiums, Summer Meeting, 1901, Award of 273
President's Address, Report of Committee on..... 14
President's Annual Address, W. W. Pendergast..... 11
Program, Annual Meeting, 1901..... 474

R

Raspberries and Blackberries, Operations in Working the Soil in Growing, W. S. Widmoyer..... 212
Raspberry and Blackberry, Raising Plants of the, A. M. Shepherd..... 352
Raspberry Field, Laying out and Setting the, Rolla Stubbs..... 275
Reeves, Vincent, Rotation of Crops..... 115
Resolutions in Memory of John S. Harris..... 271
Resolutions in Memory of Prof. Otto Lugger..... 272
Richardson, S. D., Tools for Garden and Orchard Use..... 307
Richardson, S. D., Vice-Pres. Report, 1900, Second Cong. Dist..... 89
Rings, The Tale of the, H. H. Chapman..... 429
Robertson, Prof. Wm., Annual Meeting, Iowa State Horticultural Society, 1900 70
Robertson, Prof. Wm., Methods of Plowing as a Preparation for Planting Fruits 168
Rogers, Jesse E., The Winnipeg Meeting..... 122
Rotation of Crops, Vincent Reeves..... 115

S

Sampson, C. W., Movement of the Soil in the Successful Vineyard..... 213
Sampson, C. W., Report of Eureka Trial Station 263
Sampson, Supt., C. W., Eureka Trial Station..... 48
Sanford, Prof. Maria L., A Plea for Our Trees..... 179
San José Scale in Pennsylvania, The..... 346
School Grounds, Country, Miss Lucia E. Danforth..... 226
Schools, Agriculture in our Rural, Prof. W. M. Hays 253
Secor, David, Subsoiling as a Preparation for Fruit Culture..... 206
Secor, Eugene, Bees and Horticulture..... 445
Secretary's Annual Report, 1900, A. W. Latham..... 16
Secretary's Corner,.....38, 79, 119, 158, 199, 237, 278, 318, 359, 399, 439, 479
Seedlings, A Very Interesting Family of Tetofsky, E. H. S. Dartt..... 408
Seedlings in 1900, J. S. Harris..... 201
Shepherd, A. M., Raising Plants of the Raspberry and Blackberry..... 352
Simmons, H., Ginsing Culture..... 185
Small Fruit Farm and General Principles Involved, Laying out the, Thos. E. Cashman..... 173
Small Fruit Farm, Rotation on, C. W. Merritt..... 112
Small Fruits in Northeastern Minnesota, H. H. Chapman..... 348
Small Fruits, Originating New Varieties of, J. C. Kramer..... 351
Smith, L. Z., Plum Culture..... 421
Snyder, Prof. Harry, Plant Food for Horticultural Crops..... 425
Somerville, Wm., Apples Best Adapted to Southern Minnesota..... 147
Some Lessons of the Year 1900, J. S. Harris..... 284
South Dakota State Horticultural Society, Annual Meeting, 1901, Dewain Cook 104
Southern Minnesota Horticultural Society, Annual Meeting, Mrs. Chas. Brainerd, Secretary 20
Southern Minnesota Horticultural Society, Jonathan Freeman..... 412

Spickerman, C. W., Irrigation..... 418
Spraying Fruit Trees, F. W. Kimball..... 379
Stager, Mrs. Jennie, Report of Sauk Rapids Trial Station 264
Stager, Mrs. Jennie, Vice-Pres. Report, 1900, Sixth Cong. Dist..... 92
Stager, Supt., Mrs. Jennie, Sauk Rapids Trial Station..... 60
State Fair, Horticulture at the 1901 Minn., A. W. Latham..... 361
Stevenson, A. P., Fruit in Manitoba..... 141
Strand, Sec., G. W., Annual Meeting, Minnesota State Forestry Association 22
Strand, Geo. W., Growing Gooseberry and Currant Plants..... 203
Strand, G. W., Preparation and Care of the Soil in the Strawberry Field 178
Strawberries for Minnesota, Varieties of, F. F. Farrar..... 231
Strawberry Culture, Commercial, C. W. Gurney..... 321
Strawberry Field after Plowing and before Resetting, Treatment of the, John Eklof 355
Strawberry Field, Laying out and Planting the, A. W. Keays..... 177
Strawberry Field, Preparation and Care of the Soil in the, Geo. W. Strand 178
Strawberry Plantation of W. E. Fryer, Frontispiece.....Opp. 321
Strawberry Plants for Re-Setting, Growing, E. F. Peck..... 299
Strawberry, Raspberry and Blackberry, What to Plant with the, M. Cutler 277
Stubbs, Rolla, Blackberry Culture..... 353
Stubbs, Rolla, Laying Out and Setting the Raspberry Field..... 275
Subsoiling as a Preparation for Fruit Culture, David Secor..... 206
Subsoiling as a Preparation for Fruit Culture, Frank Yahnke..... 186
Summer Meeting, 1901, Notice of..... 235
Summer Meeting, 1901, Report of, Miss Emma V. White..... 266
Sun-Scalded Soft Maple, Prof. S. B. Green..... 350
Superintendents of Trial Stations, 1901..... 7
Syringa Columbiana, Prof. S. B. Green..... 454
Syringa Japonica, Prof. S. B. Green..... 306

T

Taylor, G. D., Protection from Drouth and Winter-Killing..... 381
Taylor, W. L., Draining of Marsh Land, and Its Use in Gardening..... 189
Terry, Alfred, Growing Trees in and for the Windbreak..... 182
Terry, A., Notes on the Windbreak..... 210
Tomlinson, Wm., My Annual Flowers..... 87
Tools for Garden and Orchard Use, S. D. Richardson..... 367
Treasurer's Annual Report, H. M. Lyman..... 19
Trees and Plants, Improving, W. W. Pendergast..... 441
Trees, A Plea for Our, Prof. Maria L. Sanford..... 179
Trees, Close Planting of, J. S. Harris..... 136
Trial Stations, Annual Reports, 1900..... 45
Trial Station, Central, St. Anthony Park, Prof. S. B. Green, Supt..... 45
Trial Station, Eureka, C. W. Sampson, Supt..... 48
Trial Station, Excelsior, H. M. Lyman, Supt..... 49
Trial Station, La Crescent, J. S. Harris, Supt..... 50
Trial Station, Meadow Vale, A. W. Keays, Supt..... 63
Trial Station, Minnesota City, O. M. Lord, Supt..... 54
Trial Station, Montevideo, L. R. Moyer, Supt..... 55
Trial Station, Pleasant Mounds, J. S. Parks, Supt..... 59
Trial Station, Sauk Rapids, Mrs. Jennie Stager, Supt..... 60
Trial Station, Windom, Dewain Cook, Supt..... 61
Trial Stations, Midsummer Reports, 1901..... 262
Trial Station Report, Central, Prof. S. B. Green..... 262
Trial Station Report, Eureka, C. W. Sampson..... 263
Trial Station, La Crescent, Mid-Summer Report, F. I. Harris, Supt..... 472
Trial Station Report, Minnesota City, O. M. Lord..... 263
Trial Station Report, Pleasant Mounds, J. S. Parks..... 264
Trial Station Report, Sauk Rapids, Mrs. Jennie Stager..... 264

Trial Station Report, Windom, Dewain Cook..... 265
Trigg, J. S., Apples..... 138
Trigg, J. S., Commercial Orchards for the Northwest..... 241
Two Minute Speeches at Close of Annual Meeting, 1900..... 194

U

Underwood, Roy, Effective Improvements on the Home Ground..... 385

V

Valuable Facts, Edson Gaylord..... 312
Varieties of Fruit at the 1901 Minn. State Fair..... 363
Vice-Presidents' Reports, 1900..... 89
Vice-President's Report, 1900, First Cong. Dist., F. W. Kimball..... 89
Vice-President's Report, 1900, Second Cong. Dist., S. D. Richardson..... 89
Vice-President's Report, 1900, Third Cong. Dist., Mrs. A. A. Kennedy.... 91
Vice-President's Report, 1900, Sixth Cong. Dist., Mrs. Jennie Stager..... 92
Vice-President's Report, 1900, Seventh Cong. Dist., D. T. Wheaton..... 93
Vineyard and Planting the Vines, My Way of Laying out the, A. D. Leach 417
Vineyard, Movement of the Soil in the Successful, C. W. Sampson..... 213

W

Waldron, Prof. C. B., Transplanting and Care of Evergreens..... 219
Watrous, C. L., Propagating New Varieties of Fruits from Seed..... 432
Wedge, Clarence, Growing Evergreens from Seed..... 310
Western Horticultural Society, Annual Meeting, 1901, T. A. Hoverstad.. 165
Wheaton, D. T., Vice-Pres. Report, 1900, Seventh Cong. Dist..... 93
White, Emma V., Annual Meeting Woman's Auxiliary..... 36
White, Miss Emma V., Report of Summer Meeting, 1901..... 266
Widmoyer, W. S., Working the Soil in Growing Raspberries and Blackberries 212
Wilford's Apple Seedling..... 423
Windbreak, Growing Trees in and for the, Alfred Terry..... 182
Windbreak, My Scotch Pine, P. P. Klevann..... 146
Windbreak, Notes on the, A. Terry..... 210
Winnipeg Meeting, The, Jesse E. Rogers..... 122
Winter Killing, Protection from Drouth and, G. D. Taylor..... 381
Wisconsin State Horticultural Society, Annual Meeting, 1901, W. W. Pendergast 101
Wittmann, Aug., Laying out the Plum Orchard, Handling the Trees and Planting 172
Woman's Auxiliary, Annual Meeting, Miss Emma V. White..... 36
Wood Paper Industry, The, H. B. Ayres..... 403
Wright, R. A., The Use of Drain Tile in Garden and Orchard..... 143

Y

Yahnke, Frank, Subsoiling as a Preparation for Fruit Culture..... 186
Yard, How to Improve and Beautify the Farm, Mrs. A. W. Massee..... 448